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United States Court Reporter

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
BILLINGS DIVISION**

UNITED STATES FIDELITY)	
AND GUARANTY COMPANY,)	
)	Nos. CV-04-29-BLG-RFC
Plaintiff,)	CV-08-29-BLG-RFC
and)	
)	VOLUME 5
THE CONTINENTAL INSURANCE)	TRANSCRIPT OF JURY TRIAL
COMPANY,)	
Plaintiff Intervenor,)	
vs.)	
)	
SOCO WEST, INC.,)	
Defendant.))	
_____)	

**BEFORE THE HONORABLE RICHARD F. CEBULL
CHIEF UNITED STATES DISTRICT COURT JUDGE
FOR THE DISTRICT OF MONTANA**

James F. Battin United States Courthouse
316 North 26th Street
Billings, Montana 59101
Friday, March 12, 2010
08:33:50 to 16:19:22

Proceedings recorded by machine shorthand
Transcript produced by computer-assisted transcription

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MS. JULIANNE ROHM
MR. NEIL BAILEY

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362	09/13/89 Memo to Q. Dyce from Naff FPT/ 28, 57
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1 PROCEEDINGS

2 (Open court.)

3 (Jury not present.)

4 MR. COZZENS: There's a housekeeping matter to
5 discuss first.

6 THE COURT: What?

7 MR. COZZENS: It has to do with their designations
8 of the portions of the deposition of Marvin Johnson they want
9 to play today.

10 THE COURT: Be seated.

11 I read the briefs. I like this statement in your
12 brief, "The insurers elected to cross-examine Johnson on
13 matters within the scope of his direct, and they have now
14 waived their ability to elicit further testimony on subjects
15 that they could have asked about but did not."

16 I don't really know what that means.

17 MR. COZZENS: Can I explain that?

18 THE COURT: No. I laid down the rule that you're
19 not going to rehash what you did on cross, which was not very
20 much.

21 MR. JOHNSON: The only thing I asked was about dates
22 of employment. We've taken dates of employment out of the
23 tape we're going to play.

24 THE COURT: I am denying the motion --

25 MR. JOHNSON: Thank you, Your Honor.

1 THE COURT: -- on the Marvin Johnson motion to
2 exclude certain designated deposition testimony.

3 And then I just found out that I didn't -- I guess I
4 haven't gotten through Richard Brill's depo, but I will do
5 that during this -- I'll have it done here in short order.

6 MR. JOHNSON: Thank you, Your Honor.

7 (Jury present.)

8 THE COURT: Good morning, ladies and gentlemen.
9 Please sit.

10 All right. I think, Mr. Lynch, you were in direct
11 exam.

12 MR. LYNCH: Yes, Your Honor.

13 While we're waiting, Julianne, could you please pull
14 up Illustrative DD136?

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 WHEREUPON,

17 ROBERT LESLIE POWELL, Ph.D.,
18 called for examination by counsel for defendant, after having
19 been previously sworn to testify the truth, the whole truth,
20 and nothing but the truth, testified as follows:

21 DIRECT EXAMINATION (Continued)

22 BY MR. LYNCH:

23 Q Good morning, Dr. Powell.

24 A Good morning.

25 Q When we left off yesterday, you were telling us about

1 some of the indicators that the government contractors had
2 used to try to find and identify the DNAPL source areas on the
3 Dyce Chemical property. I'd like to briefly continue with
4 that.

5 I believe you said that soil concentrations are the most
6 reliable indicator of the local source of DNAPL; is that
7 correct?

8 A That's correct.

9 Q And why is that?

10 A EPA computed a concentration that would be at a level
11 that it would have been impossible to achieve this much or to
12 see this much perc in the soil unless there was a DNAPL
13 present. What they essentially assumed is that the soil was
14 completely saturated, the water in the soil contained perc at
15 its solubility limits, so the maximum amount that you could
16 ever dissolve in the water, and that the perc from the water
17 then also absorbs into the soil, because the soil is like a
18 sponge. It will soak up some of the perc out of the water.
19 And with all of that, they computed what would be that
20 threshold level, and that is the 189 parts per million that
21 they computed.

22 If there is more than that there, it is more than water
23 and soil can hold without there being a DNAPL-phase, without
24 there being pure perc also in the soil, so they use that as a
25 threshold for identification of perc. In my experience,

1 that's quite a high level. If you have levels up in the 200
2 ppm or higher, it's almost a dead certainty you have a perc
3 condition, a DNAPL condition of perc in the soil.

4 Q Dr. Powell, in addition to looking at soil
5 concentrations, do you also look at the mixture or the variety
6 of chemicals that are found in the soil?

7 A Well, that's certainly a factor in this case. When
8 you're looking at the soil in the northwest corner, it is
9 unique as compared to other areas of the site in that it
10 contains only perc and its degradation products. It doesn't
11 contain the other chemicals that the facility was handling and
12 that you find in other parts of the property.

13 Q Let's turn to groundwater, then. I believe you said
14 groundwater is the next most reliable indicator. What makes
15 it not as good as soil as an indicator of a local DNAPL
16 source?

17 A The indicator they use for groundwater is the
18 concentration of the chemical in water as compared to its
19 solubility limit. The solubility limit for perc -- and I
20 believe, Mr. Lynch, we have a demonstrative to show that will
21 help me.

22 MR. LYNCH: Julianne, would you please pull up
23 DD137?

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 THE WITNESS: This is essentially a bar chart. The

1 left side of the chart would indicate a region in which there
2 is low concentrations of perc in the water. As you go left to
3 right, the concentrations are increasing. The solubility
4 limit of perc in water is 240 parts per million, or 240,000
5 parts per billion. One percent of that is 2,400 parts per
6 billion, and that's what you see here as the first region on
7 the bar chart.

8 One percent of the solubility limit is considered to
9 be an indicator of a DNAPL-like condition in the soil.
10 There's enough contamination in the soil that, when it
11 contacts groundwater, it can cause these levels of
12 contamination. Anything less than that, and it's unlikely
13 you'd have a DNAPL condition.

14 In my own experience, I would say at that point it's
15 certainly possible but not absolute certainty that a DNAPL
16 condition exists. As you move up the bar chart to even higher
17 concentrations, to 10 percent, for example, of the solubility
18 limit, a possibility becomes a very high probability that
19 there is a DNAPL condition. Certainly anything over
20 10 percent of solubility limits is just about a certainty that
21 there is DNAPL in the soil that's affecting the water.

22 The reason this is not as reliable an indicator,
23 though, as the soil itself is groundwater moves. It doesn't
24 just stay in one place, and so if you have a perc DNAPL source
25 in soil that's affecting groundwater, you're certainly going

1 to see high concentrations right there in the area where the
2 soil is contaminated. But as that groundwater moves
3 downstream and forms a plume of contamination, you'll see very
4 high levels in that plume as well. That doesn't necessarily
5 mean that the downstream area contains DNAPL, but it means
6 that the groundwater that is in that area has been affected at
7 some point upstream by a DNAPL source.

8 As an example of that, I'm working on a site in
9 Massachusetts right now that has a very large perc DNAPL
10 source. It was a dry well where they were disposing perc into
11 the soil, and it affected groundwater. A thousand feet
12 downstream from that dry well, the groundwater is discharging
13 into a swamp, and we have concentrations down there of 2 to
14 10,000 parts per million, so it's in this possible, to
15 probable, to almost dead certainty range that there's a DNAPL
16 source there, but it's far removed from where the actual perc
17 was released, and we have no indication there's any disposal
18 down there, but it's clearly a high level, nonetheless.

19 So you have to be careful interpreting groundwater
20 data that it's indicative of a DNAPL release but not
21 necessarily a release in the location where the measurements
22 are being made. It could be somewhere else further upstream.
23 And in that respect, it's not quite as definitive as the soil
24 numbers. If there's a release in soil and you drill and test
25 the soil, you're going to see it, and it's going to be right

1 there.

2 MR. LYNCH: You can take that down, Julianne.

3 DOCUMENT TECHNICIAN: (Complied with request.)

4 BY MR. LYNCH:

5 Q The third factor that EPA relied on was off-scale MIP
6 readings. And, again, what are those?

7 A An MIP probe is a probe that's driven into soil with a
8 hydraulic ram, and there's an instrument on the end of it, a
9 detector, and it measures an electrical signal. And like an
10 electrocardiogram or a seismograph, it's plotting a line on a
11 chart. And when it's getting a very strong signal, what EPA
12 calls an off-scale signal, it's indicative of high levels of
13 chlorinated compounds in the soil or in the groundwater that
14 would possibly be indicative of a perc NAPL zone or otherwise
15 just a contaminated zone with perc. It is not as definitive
16 as the other measurements because it's not a direct
17 measurement of how much is there. It's sort of an indirect
18 detector that indicates, "There's something there we ought to
19 go take a look at. Let's go get a sample and see what's
20 really there," but it's not a direct measurement where it's
21 reporting the concentration of perc in the soil.

22 Q Now, Dr. Powell, I'd like to turn to the data that was
23 gathered from the northwest corner itself and discuss how
24 these various indicators appear in that data.

25 Can you just generally describe what was found in the

1 soils in the northwest corner?

2 A Well, in those areas where there was a DNAPL release,
3 they typically found very high concentrations of perc in the
4 soil, well above their 189 ppm threshold. They found very
5 high concentrations in the groundwater in the monitoring wells
6 they drilled through those soils, concentrations as high as
7 30 percent or more of the solubility limit. And they found
8 MIP logs which were off-scale, almost from the surface all the
9 way down to the bottom of the bore hole. So all three
10 indicators that EPA was using were essentially a bright signal
11 that there's a DNAPL source here.

12 Q And I believe we have a demonstrative on this.

13 Julianne, can you please pull up Proposed Demonstrative
14 DD139?

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. LYNCH:

17 Q And, Dr. Powell, could you explain this figure that's on
18 the screens?

19 A Well, this shows illustrative data from the northwest
20 corner area at Boring MP-100 and PT-2. They are two separate
21 borings that were very close to each other.

22 The first thing they observed when they did the testing
23 there was they did an MIP log and got an off-scale reading.
24 That's the chart that's on the right side of this
25 demonstrative, and, this, initially what was a low level here

1 near the surface went off the scale, and then they charted
2 off-scale all the way to the bottom of the hole, and this is
3 the type of signature you'd expect to see if you were in a
4 DNAPL source area. At least you would see that type of
5 signature as long as you were within the DNAPL zone.

6 They also then went in and tested soil at several
7 intervals in a bore hole right next to where this MIP log was
8 done, and they found concentrations well above the threshold
9 for DNAPL.

10 There were two samples that they collected. These are
11 both from the silty clay layer within the water table, so they
12 weren't up in the vadose zone. They were down in the water
13 table.

14 The shallower of those two, which was collected from 6 to
15 8 feet below ground, contained over 2,000 parts per million.
16 So more than 10 times their threshold level for DNAPL.

17 The deeper sample from 10 to 12 feet contained
18 1,300 parts per million. This sample is right at the bottom
19 of the silty clay layer, just as you're starting to break
20 through into the sand and gravel.

21 Both of them are indicative of DNAPL conditions in the
22 soil, and it shows that the DNAPL, once it was released,
23 migrated down through the vadose zone and all the way through
24 the silty clay, at least to the bottom of it, and eventually,
25 I believe, into the sand and gravel unit.

1 They also tested groundwater at this location and got
2 72,000 parts per billion. That's 30 percent of the solubility
3 limit. It's in a range in which it's an absolute dead
4 certainty there's a NAPL source there, or very close by. You
5 don't see those kinds of concentrations unless you're in a
6 NAPL zone.

7 (Discussion off the record.)

8 BY MR. LYNCH:

9 Q Dr. Powell, earlier you had mentioned -- we were talking
10 about the mixture of chemicals that were found in the
11 northwest corner. Can you tell us, you know, what was found
12 there as far as types of variety of chemicals?

13 A The chemicals that were found there that are of interest
14 to EPA certainly in the Superfund program are the chlorinated
15 solvents. Perc is the main chemical that's there. By far,
16 it's the largest mass of chemical that was there.

17 As the perc begins to dissolve into water, bacteria can
18 break it down into other chemicals; first, into
19 trichloroethylene, what we call TCE; and subsequently into
20 dichloroethene, DCE. But that won't happen until it's
21 dissolved in the water. The same bacteria cannot break perc
22 down as long as it's in a NAPL form. So there are low
23 concentrations of TCE and DCE that are detected in this same
24 area, the degradation products of the perc.

25 As compared to samples further up in the property,

1 though, you don't really see BTEX in this area, in the soil.
2 This is really a monochromatic, a monolithic perc problem.
3 That's really all that's there, and really it's all that's a
4 focus of the Superfund cleanup, is the perc that's there.

5 Q And how about the location of the chemicals in the
6 subsurface? I believe you said there were hits from shallow
7 to deep. What was the range in the subsurface that they found
8 concentrations of perc?

9 A The highest that I can recall in the soil sample was in
10 the range of about 2,500 parts per million. So that's roughly
11 15 times EPA's threshold number for identifying a DNAPL zone.

12 Q And how deep in the subsurface did they find perc in the
13 northwest corner?

14 A The highest levels were found in the middle and lower
15 part of the silty clay unit from 4 feet down to about 12 feet
16 below ground surface. Essentially it's in the water table
17 portion of the silty clay, not up in the vadose zone. And
18 then lower levels were found below that in the sand and gravel
19 aquifer.

20 Q And, Dr. Powell, the exhibit, demonstrative, you have on
21 the screen here, this is referring to two borings, you said?

22 A Yes. The MP-100, which is where the MIP log was done,
23 and then subsequent PT-2, which is where they drilled a soil
24 boring and installed a monitoring well.

25 Q Okay. And we've seen the figure from the ROD where we

1 have the green figures depicting the source areas. The
2 northwest corner is a fairly sizable area. Is this pattern
3 repeated throughout the entire northwest corner?

4 A The general patterns are repeated, but they vary
5 depending on the bore hole. This particular boring was taken
6 in an area where EPA believes there was a surface release of
7 the perc and it migrated down through the vadose zone, reached
8 the water table, and then began to spread laterally. In other
9 portions of the northwest corner, the patterns may be slightly
10 different because they may represent, for example, lateral
11 spreading within the water table rather than percolation down
12 from the surface. So each location may look slightly
13 different, but they all show these same characteristics of
14 high levels in the soil, high levels in the water, and strong
15 MIP signals in at least a portion of the boring.

16 MR. LYNCH: You can take down the demonstrative.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. LYNCH:

19 Q When we look at the factors you were just talking about,
20 the high concentrations in soil and groundwater, the general
21 lack of BTEX, little degradation, and the off-scale MIP
22 readings throughout the boring, when you compare that to the
23 contamination that was found in the operational portions of
24 the site, do you see the same contamination signature?

25 A Well, you do with regard to perc. I mean, there was perc

1 found in the operational portions of the site behind the,
2 behind the drum loading shed. And so you see the same kind of
3 characteristics: high levels of perc in the soil, high levels
4 in groundwater, MIP signals that are strong.

5 What's different about that area, though, is there's a
6 lot of other chemicals there, too. In particular, there's a
7 lot of BTEX there, particularly xylene, toluene, because
8 that's one of the major chemicals that they were handling in
9 that area. And there were releases of BTEX obviously to the
10 soil that's affected that area as well. That's distinctly
11 different than the northwest corner because you don't see
12 those high levels of BTEX and other types of chemicals in the
13 northwest corner as you do up in the operations area.

14 MR. LYNCH: Maybe let's put up Illustrative DD104.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 MR. LYNCH: I'm sorry. That's DD103, please.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. LYNCH:

19 Q I believe, Dr. Powell, you were just talking about the
20 contamination that was found in the main tank farm area. Can
21 you point out where that is shown on this figure? And then
22 the northwest corner, can you indicate that as well?

23 A (Complied with request.)

24 Q Now, Dr. Powell, can you tell us what these, the pie
25 graphs on this chart represent?

1 A The colors, as you can see in the legend down in the
2 lower left corner, are related to specific chemicals. The
3 green, the large green circles in the northwest corner depict
4 areas in which perc, PCE, was detected at concentrations above
5 EPA's threshold for identification of the DNAPL area, and so
6 you can see there's quite a number of individual borings
7 throughout that northwest corner area where they found these
8 high levels of perc in the soil.

9 The pie chart up in the main plant area, the one in the
10 lower right-hand portion of this figure, also shows that
11 there's quite a lot of perc there in the soil. There clearly
12 was a perc release there. But the second most dominant
13 chemical, the yellow color, is associated with xylene. That's
14 one of the BTEX compounds. And so there are significant
15 quantities of BTEX there as well, and you can see by this
16 figure that that area is distinctly different than the
17 northwest corner in that it contains a richer menu of
18 chemicals, if I could put it that way.

19 MR. LYNCH: Close out of this one, please, Julianne.

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 MR. LYNCH: Let's pull up, then, DD105. Blow it up,
22 please.

23 DOCUMENT TECHNICIAN: (Complied with request.)

24 BY MR. LYNCH:

25 Q And, Dr. Powell, can you explain what's depicted on this

1 chart? And again, contrast the northwest corner from the main
2 tank farm area.

3 A Well, this chart is showing the concentrations of
4 chemicals dissolved in groundwater as compared, in the case of
5 perc, as compared to EPA's 1 percent of solubility threshold
6 of 2,400 ppb, so we've only shown on the chart those locations
7 where we've crossed over that threshold and it might be
8 indicative of a NAPL-like condition.

9 What the chart shows is that we have very high levels of
10 perc in the groundwater throughout the northwest corner area.
11 There are some much lower concentrations of TCE, that's the
12 light blue color, or cis-1,2-DCE, that's the darker blue
13 color. Those are the two primary degradation products for
14 perc once it dissolves into the water. That's what it will
15 break down into.

16 Up in the main plant area, you also have perc in the
17 water, but the concentrations are lower. For example, down
18 towards the catch pond area, the concentrations they found of
19 perc in the water there are much lower than were found just a
20 little further downstream in the northwest corner area.

21 MR. LYNCH: Close out of this one, Julianne.

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 BY MR. LYNCH:

24 Q And, Dr. Powell, you just mentioned the contamination
25 found near the old catch pond area. Is that the source area

1 EPA has identified as the acid tank farm source area?

2 A Yes. It's the same area.

3 Q And I believe you said it was near the former catch pond.

4 Can we please pull up Illustrative Exhibit DD132?

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. LYNCH:

7 Q Can you explain what this illustrative is, Dr. Powell?

8 A Well, these are two different aerial photographs that
9 show the catch pond area at different points in time. The
10 photograph on the left is a picture from 1975. It shows a
11 smaller catch pond of roughly 400 or 500 square feet in area
12 in the corner of the berm.

13 In late 1980 or early 1981, the catch pond and berm were
14 rebuilt, and you can see, in the photograph on the right, that
15 it became quite a bit larger than the earlier catch pond in
16 '75. So it's two different views of the same area reflecting
17 that reconstruction.

18 MR. LYNCH: Okay. And could you close out of this
19 one and please pull up Illustrative DD082?

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. LYNCH:

22 Q What does this illustrative depict, Dr. Powell?

23 A This demonstrative shows the locations of two soil
24 borings that EPA drilled in the vicinity of the catch pond
25 which were investigated -- being used to investigate for the

1 potential source of a DNAPL release. They were wanting to
2 find out if there were DNAPL-like conditions in the soil
3 around the catch pond, so they drilled these borings.

4 Q And this is over the 1975 configuration of the catch
5 pond; is that correct?

6 A That's correct.

7 MR. LYNCH: And could you please pull up DD118?

8 DOCUMENT TECHNICIAN: (Complied with request.)

9 BY MR. LYNCH:

10 Q And, Dr. Powell, this is a similar figure. Is this the
11 same borings superimposed over the 1981 configuration of the
12 catch pond?

13 A Yes, it is.

14 Q Accurate to say, then, that both of those borings were
15 actually within the eastern side of the catch pond as it was
16 configured at this time?

17 A Well, I think it would be accurate to say in 1975 these
18 borings would have been just off the eastern edge of the catch
19 pond, perhaps in an area where it could have overflowed but
20 not inside the pond proper. With the expansion of the pond in
21 1981, the borings were inside the boundary of the pond.

22 MR. LYNCH: Close that out, Julianne.

23 DOCUMENT TECHNICIAN: (Complied with request.)

24 BY MR. LYNCH:

25 Q And, Dr. Powell, was the contamination signature that was

1 found in those borings the same as what we just discussed that
2 was found in the northwest corner?

3 A No, it was quite different than what was found in the
4 northwest corner.

5 MR. LYNCH: And, Julianne, maybe pull up
6 Illustrative DD140.

7 DOCUMENT TECHNICIAN: (Complied with request.)
8 BY MR. LYNCH:

9 Q Can you walk us through this illustrative, Dr. Powell?

10 A This is an exhibit that shows information from one of the
11 two borings in the catch pond, MP-105. This is the boring
12 that led the consultants working for EPA and the remedial
13 investigation to identify this as a possible area of release
14 of perc into the soil.

15 Like in the northwest corner, they used the same types of
16 investigative techniques. They did an MIP log, which is shown
17 on the right side. This log is distinctly different than what
18 we saw in the northwest corner in that it didn't immediately
19 push the needle out to the far right side off scale and
20 maintain it there all the way down, and so you see a chart.
21 It's this fine line here, if I can trace it. You see a chart
22 that, for the most part, doesn't give you much of a signal.
23 One little blip here at about this level. And then, finally,
24 an off-scale signal right here at the very bottom of the bore
25 hole. That off-scale signal at the bottom of the bore hole,

1 over in the northwest corner area, was exhibited top to bottom
2 from just a foot or two below the surface all the way to the
3 bottom of the bore hole.

4 So the MIP log for this area is quite different in that
5 it doesn't show nearly the level of signal that might be an
6 indication of a contamination from top to bottom as we saw
7 over in the northwest corner.

8 The other things that are distinctly different about this
9 area and this log is they went in, after doing the MIP log,
10 having identified this area where they got the first blip on
11 the log, and this deeper area, and they took samples. In the
12 shallower of those two, they took a soil sample and tested it
13 for perc, and they found .17 parts per million. That's a very
14 low level as compared to what they were looking for. That's
15 only 1/1000th of their threshold for a NAPL release. That's
16 10,000 times less than was found over in the northwest corner
17 in the highest borings that have NAPL-like conditions. So
18 it's a relatively low level of perc.

19 It's probably indicative, because that, that sample is
20 taken at what would have been the base, the bottom soil layer
21 in the catch pond before it was filled with fly ash, it's
22 probably indicative of, sometime in the past, stormwater
23 runoff from the main plant getting to the catch pond that had
24 some amount of perc dissolved in it that then was absorbed
25 into and became part of the soil in the bottom of the pond.

1 But it's not nearly high enough to be indicative of a DNAPL
2 condition in the pond. As I said, it's a thousand times below
3 that DNAPL threshold that they were using.

4 Deeper, they took a second sample. At the very bottom of
5 the bore hole, so this is at the very, very bottom of the sand
6 and gravel unit, right on the top of bedrock, where they got
7 the other off-scale signal, and they found 2,960 parts per
8 billion of perc in the groundwater. This is just slightly
9 above 1 percent of the solubility limit, so it's up into that
10 range where a DNAPL condition is possible. Not necessarily
11 dead certain, but certainly possible.

12 This is different, though, than what was seen in the
13 northwest corner, both in terms of the concentrations that
14 were seen. You may recall that the monitoring wells in the
15 northwest corner were showing levels as high as 72,000. This
16 is only 2,900, so it's quite a bit less. But it's also
17 distinctive that they only found perc in the groundwater at
18 the very bottom of the aquifer. They didn't find any
19 indication on the MIP log that there was any contamination in
20 the shallower zones in the groundwater.

21 The reason that's important is that when you have a
22 release of perc in a DNAPL area that's at the surface, the
23 first shallow groundwater at the water table should reflect
24 that contamination, because the perc is trickling down through
25 the soil and ultimately invading the water table. The water

1 table should be contaminated from the surface all the way down
2 to the bottom of the DNAPL zone.

3 When you see a pattern like this where the contamination
4 is deep but not shallow, it's indicative of a release that
5 probably occurred somewhere further upstream and has been
6 flowing down to this area, because as these chemical plumes
7 migrate with groundwater from the upland area down into a low
8 area, they tend to move deeper into the aquifer as they
9 migrate. And here we only see the contamination at the bottom
10 of the aquifer. We don't see anything at the surface of the
11 aquifer, the top of the water table.

12 That's a strong indication, I think, that there was no
13 DNAPL release in this area, but there is high levels,
14 nonetheless, in the groundwater likely reflecting a release
15 that occurred somewhere further upstream, perhaps up in the
16 tank farm area of the property. And in that respect, I mean,
17 this condition is quite unlike what we saw over in the
18 northwest corner where there was a clear, unambiguous signal
19 of a NAPL release right there in the local soil.

20 MR. LYNCH: Can you close out of this one and again
21 pull up Illustrative DD118?

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 (Discussion off the record.)

24 BY MR. LYNCH:

25 Q Again, this is the borings that were taken in the catch

1 pond area. We just got done discussing MP-105. Now I would
2 like to take a look at what was found in MP-129.

3 And, Julianne, could you please pull up Illustrative
4 DD141?

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. LYNCH:

7 Q Would you explain what this is, please, Dr. Powell?

8 A This is an MIP log that EPA collected from Boring 129,
9 which was in the same footprint in the catch pond. As the
10 first bullet says, there was no meaningful response. You can
11 see the chart here is essentially a flat line. No signal of
12 any note from the surface all the way down to the bottom of
13 the bore hole. There was so little of interest on this, this
14 MIP log that EPA decided it wasn't worth their time and money
15 to spend sampling the soil or the groundwater, so this
16 essentially is a signal that there is no contamination here,
17 certainly no perc contamination or DNAPL levels of perc
18 contamination.

19 Q I think you probably covered most of this, but just for
20 comparison sake, Julianne, can you please pull up DD140? I'm
21 sorry; that's DD143.

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 BY MR. LYNCH:

24 Q And obviously, Dr. Powell, this is labeled comparison of
25 the borings found from the northwest corner and the catch pond

1 areas. Can you just again briefly describe what the
2 differences are?

3 A Well, this just contrasts what we saw in a clear DNAPL
4 release area that's MP-100 on the right side. Top to bottom,
5 strong signal in the MIP log. High concentrations in the
6 soil. Though it's not shown on this log, very high
7 concentrations in the groundwater. As contrasted to MP-105 in
8 the catch pond area, where there's a more erratic signal,
9 generally a low signal where the tested soil concentrations
10 were very low. And where they found contamination of the
11 groundwater, it was only at the very bottom of the bore hole.

12 MR. LYNCH: You can close out of that, Julianne.

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. LYNCH:

15 Q And Dr. Powell, in review of the material in connection
16 with this case, did you review any historical sampling from
17 the catch pond area that also informs your opinion as to
18 whether that is a local DNAPL source?

19 A Yes. Sometime around 1985, Dyce had a local contractor,
20 local consultant, come in and do some sampling --

21 Q Perhaps I could pull up --

22 A -- sampling of sediments in the catch pond.

23 MR. LYNCH: Perhaps we could pull up Exhibit 856A.
24 And go to page 2, please.

25 DOCUMENT TECHNICIAN: (Complied with request.)

1 BY MR. LYNCH:

2 Q Dr. Powell, this is an exhibit we looked at with Monte
3 Naff the other day.

4 Could you please turn to page 68 of this exhibit?

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. LYNCH:

7 Q And, Dr. Powell, this is one of the pages from the
8 exhibit that Monte Naff discussed, and it showed some results
9 of some samples he had taken from the liquids and solids in
10 the catch pond area. Can you tell us what about the findings
11 of this inform your opinion?

12 A In paragraph 2 --

13 MR. LYNCH: Can you zoom out, Julianne, please?
14 Just go from there to the bottom.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 MR. LYNCH: Thank you.

17 THE WITNESS: In paragraph -- actually now that it's
18 blown up, I guess it's B, of this report, they report on the
19 results of their testing of sediments from the bottom of the
20 catch pond for halocarbons. Halocarbons are a synonym for
21 chlorinated hydrocarbon compounds. It would include perc,
22 TCE, DCE, the things that we've been finding in groundwater
23 and soil, so it's a test for the same kind of chemicals. And
24 as they report here at the bottom of this paragraph, no
25 measurable levels of these chemicals were found in the

1 sediments in the pond.

2 BY MR. LYNCH:

3 Q And how does that inform your conclusions about the
4 origins of the contamination beneath the catch pond that EPA
5 has found?

6 A Well, I think this finding is completely consistent with
7 what the borings showed that EPA drilled in this area. There
8 is no high levels of perc or TCE or other chlorinated
9 compounds that are found here, were found here in '85 or were
10 subsequently found in the investigations by EPA. I think all
11 of that information is telling a consistent story, that there
12 never has been a significant DNAPL release of perc to this
13 catch pond or from the catch pond subsequently into the soils
14 beneath it down into the water table.

15 MR. LYNCH: You can close out of this, Julianne.

16 Pull up again Illustrative DD103.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. LYNCH:

19 Q This, again, Dr. Powell, is the illustrative showing the
20 borings on the site where soil samples in excess of the EPA
21 criteria were found. I direct your attention to this small
22 dotted circle in that area. Can you tell us what that is,
23 that location?

24 A That's a location of a bore hole, SB-22, that was drilled
25 as part of the investigation of this area. And it's a

1 location where relatively low levels of perc were found in
2 shallow soils, the 1- to 4-foot range, so they're in the
3 vadose zone.

4 Q And is that another DNAPL source area?

5 A No. The concentrations that were found there were far
6 too low to be indicative of a DNAPL release. They are
7 probably more reflective of, at some point in time, water that
8 contained perc seeped into the soil in that area, absorbed
9 into the soil, and has created the low level of residual
10 contamination.

11 MR. LYNCH: You can close out of that, please,
12 Julianne.

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. LYNCH:

15 Q Dr. Powell, based on all of the data you've reviewed and
16 the differences we've just discussed between the northwest
17 corner source area and the other source areas identified on
18 the property, do you have an opinion as to whether whatever
19 type of release caused the northwest corner source area was
20 the same type of release that caused the upgradient
21 contamination?

22 A Well, I don't think releases in the tank farm area could
23 have caused the contamination down in the northwest corner.
24 The two areas are similar in that they both contain high
25 levels of perc, but they're distinctly dissimilar because the

1 tank farm area also contains BTEX and other compounds that you
2 don't see in the northwest corner. So the chemical signatures
3 are quite different in that respect.

4 Also, any release in the tank farm area is within the
5 containment. It's within the bermed area, and it would have
6 been trapped within the berm and would have, if there were
7 enough release that it would have migrated, it would have
8 ended up in the catch pond. And as we've been seeing looking
9 at the data, there really is no evidence that the catch pond
10 is a significant area of perc contamination. So those areas
11 are different in my mind than the northwest corner.

12 Q Dr. Powell, then, is it your opinion that whatever caused
13 the northwest corner had to be a separate and distinct type of
14 release from what caused the contamination we see in the acid
15 and main tank farm areas?

16 A Yes. I think it's something completely unrelated to
17 those areas.

18 Q Dr. Powell, do you have an opinion as to how much perc is
19 in the northwest corner source area?

20 A Yes, I do.

21 Q And how much do you believe is down there?

22 A In the northwest corner and the downstream groundwater
23 plume that's formed, that's flowed out to the Yellowstone
24 River, I believe there is a quantity of perc somewhere in the
25 range of 200 to perhaps a little more than 300 gallons, some

1 number within that range. It's a sizable release, to be sure.
2 It's somewhere between two and maybe a little over
3 300 gallons.

4 Q Now did you actually go out and measure the perc in the
5 subsurface?

6 A No. It's not something you can measure directly, and I
7 haven't done any personal tests. I've looked at a lot of
8 tests that others have performed, but I haven't done any
9 personal tests myself.

10 Q So how did you arrive at your opinion of 200 to 300-plus
11 gallons?

12 A Well, there's been a lot of testing of the soil and the
13 groundwater in this area. When you test the soil, the
14 laboratory is reporting the concentration of perc in the soil.
15 When you map those concentrations and define an area of
16 contamination in which there is perc, you can then, from that
17 mapping, define a volume of soil that's contaminated, and,
18 with some information on the weight of the soil, how many
19 pounds per cubic foot does it weigh, you can convert volume
20 into mass of soil that's contaminated. And then when you
21 multiply that mass by the concentration reported by the lab,
22 which are in units of pounds of perc per pounds of soil, if
23 you would, you can then directly estimate how much perc is
24 there in the soil mass.

25 You then also have to consider what's in the groundwater,

1 and, again, it's a process of determining the volume of the
2 groundwater plume and the amount of water that's there,
3 multiplying that volume by the concentration that's found
4 within the plume, and that gives you a mass of perc.

5 And then, finally, you have to consider that while there
6 is perc in the water, there is also perc absorbed to the soil
7 in the aquifer. So it's not really in the water; it's in the
8 soil that the water is in contact with, and there are standard
9 formulas for estimating that partition between water and soil.
10 So with knowledge of how much is in the water, you also can
11 then compute how much is in the soil. And when you add all
12 those things up, you get a total volume of perc that's been
13 released, and that's essentially the process that I followed.

14 Q Okay. Well, let's talk a little bit about your specific
15 calculations, and maybe we'll start with groundwater.

16 What data did you rely on to determine the concentrations
17 in the groundwater between the northwest corner source area
18 and the Yellowstone River?

19 A I principally relied on the groundwater data that was
20 collected during the EPA investigation, and then I also
21 considered some other groundwater data that was collected by
22 ATC during their investigations of the property.

23 I used the groundwater data that was collected before ATC
24 began their pilot testing and remediation program because that
25 began to remove perc from the soil, and so to understand how

1 much was originally there, I wanted to roll back the clock, if
2 you would, to a point in time before that remediation began.
3 So I was using all of those as sources of data with that in
4 mind as to when they began that remediation program.

5 Q And you spoke a little while ago about developing
6 contours for the data. Did you develop your own contours for
7 the groundwater contamination?

8 A Yes and no. I mean, most of this plume has been mapped.
9 The portion of the plume downstream of the source, the
10 northwest corner source area, has been mapped in detail in the
11 EPA reports by your contractor, Tetra Tech, and I simply
12 adopted their mapping and their contours of the plume for
13 purposes of doing those mass estimates.

14 In the source area itself, they didn't do, they really
15 didn't do much discretization of the plume there. They didn't
16 map contours with any degree of accuracy, if I could put it
17 that way, or discretization. It was essentially just one
18 large area with a lot of perc. And so I went into that area,
19 which was only a small part of the plume, and did some
20 additional mapping so that I could better understand where the
21 groundwater was most contaminated and where it was less
22 contaminated in that source area. I wanted to do that to make
23 sure my estimates were as accurate as possible, but that's a
24 small part of the overall plume. In most of the plume, I
25 simply adopted Tetra Tech's mapping.

1 MR. LYNCH: Maybe to give me, if no one else, a
2 better picture of this, Julianne, can you please pull up
3 Exhibit 3051, which is the FS report, page 171?

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. LYNCH:

6 Q And, Dr. Powell, this is a figure from the government
7 contractors' final feasibility study report. Does this show
8 some of the contours you relied on in calculating the amount
9 of perc in the groundwater?

10 A Yes. The area up here at the top of the figure is the
11 Brenntag plume, and the contours that were mapped here show
12 the concentration of perc in the groundwater. I believe this
13 is perc, yes. Yes, it's perc. And so for the largest part of
14 the plume, I relied on that kind of mapping from the
15 government's contract reports.

16 MR. LYNCH: Could you go to the next page of the
17 exhibit, please, Julianne? And highlight the legend portion
18 of it or the label below that. Yes, there.

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 BY MR. LYNCH:

21 Q And, Dr. Powell, am I correct that the contours on this
22 figure show the amount of TCE groundwater concentrations,
23 correct?

24 A That's correct.

25 Q And TCE is one of the breakdown products of perc?

1 A Yes. As I mentioned earlier, once perc dissolves into
2 the water, bacteria will begin to break it down, and in the
3 first product that's formed, when you strip a chlorine
4 molecule off of a perc molecule, it's TCE. It goes from four
5 chlorines to three chlorines, so it goes from perc to
6 trichloroethylene.

7 MR. LYNCH: Okay. Maybe we could pull up
8 Illustrative Exhibit DD005?

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 BY MR. LYNCH:

11 Q Dr. Powell, is this an exhibit essentially showing perc
12 and its breakdown products and how it breaks down?

13 A Yes. You start with perc at the top. Strip off one
14 chlorine, and you get TCE. Strip off a second chlorine and
15 you get DCE. The principal form of -- there's two forms of
16 DCE that are shown there, cis and trans. The principal one
17 that you're going to see is cis DCE, the one on the left. And
18 then, finally, strip off another chlorine, and you get vinyl
19 chloride. So that's the typical breakdown process for perc in
20 the groundwater.

21 Q So essentially you have a given amount of perc, it kicks
22 off a chlorine, you get a little bit lesser amount of TCE,
23 kicks off another chlorine, a little less of the cis DCE, and
24 so on?

25 A That's correct.

1 Q Now did you take into consideration the amount of TCE and
2 DCE and VC that was in the groundwater in computing your
3 calculations of the mass?

4 A Yes, because all of this originally began as perc before
5 this degradation process began. You have to look at all four
6 chemicals and, in effect, back them up, adjust them back to
7 what they would have been on an equivalent amount of perc in
8 order to do this calculation, so that's what I did. I mapped,
9 mapped considered mass estimates for all four chemicals and
10 then determined how much perc would have been necessary to
11 have created that mass of the individual chemicals.

12 Q Can you tell us, Dr. Powell, then, how did you compute
13 the mass of the perc that was actually in the soil in the
14 northwest corner?

15 A I used the mapping of the source area presented by EPA in
16 the feasibility study and record of decision. This was
17 their -- the ROD is their official report on what they found
18 and what they intend to do about it in the Superfund. And so
19 I used the boundary of the source area as EPA mapped it in
20 their record of decision.

21 MR. LYNCH: Okay. And let's pull up again that
22 figure from the ROD. It's Exhibit 3059, page 121.

23 DOCUMENT TECHNICIAN: (Complied with request.)

24 MR. LYNCH: And could you blow up the northwest
25 corner area, please?

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 BY MR. LYNCH:

3 Q So that's the area for the soil of the northwest --
4 excuse me.

5 That's the area of the northwest corner that you used in
6 computing your soil mass calculations, correct?

7 A That's correct. This big oblong-shaped green area on the
8 left is the northwest corner source area that I used.

9 MR. LYNCH: Close out of that, Julianne.

10 DOCUMENT TECHNICIAN: (Complied with request.)

11 BY MR. LYNCH:

12 Q Now I believe we've seen in one of the earlier government
13 reports, the RI addendum report, that EPA initially drew the
14 northwest corner source area somewhat differently.

15 And let's please pull up Exhibit 3058, page 50.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 BY MR. LYNCH:

18 Q This is a figure from the RI addendum report, Dr. Powell.
19 And if we look at the northwest corner area, it's somewhat
20 different from what was depicted in the ROD, correct?

21 A It is slightly different, yes.

22 Q It would be, at least the portions of that that are
23 green-shaded, it's a smaller surface area; is that correct?

24 A Yes. If you could blow that section up, I think I could
25 illustrate what the differences are, but it would be a little

1 hard at this scale. My finger is not quite that fine.

2 DOCUMENT TECHNICIAN: (Complied with request.)

3 THE WITNESS: What EPA essentially did between the
4 RI addendum and the feasibility study and ROD is they came to
5 the judgment that the area to the south, centered on Boring
6 MP-132, the area down here, and the larger area to the north,
7 are interconnected and are interrelated and represent a
8 continuous zone of contamination, not two separate and
9 distinct zones of contamination. So they essentially
10 connected these areas by drawing a boundary around them like
11 this and concluded that the area in between, where they didn't
12 have any test results, was contaminated as well and should be
13 considered part of the source area.

14 MR. LYNCH: Can you go back to the ROD figure, 3059,
15 page 121? And blow up the northwest corner area again.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 BY MR. LYNCH:

18 Q Dr. Powell, did you again review the sampling and data
19 that was collected from that area?

20 A Yes, I did.

21 Q Do you agree with the government contractors' expansion
22 of that northwest corner into the size depicted in the ROD?

23 A Yes, I do.

24 Q And why is that?

25 A Well, if you look at what was found in the southern-most

1 sample, MP-132, down here in the figure, the contamination
2 that they found was clearly indicative of a DNAPL release.
3 There was over 300 parts per million of perc there in the soil
4 in the upper part of the water table. Not in the vadose zone
5 above it, but in the upper part of the water table. It's
6 twice their threshold level for DNAPL, so it's clear,
7 unambiguous information that there's a DNAPL there in the
8 soil.

9 They concluded, apparently, that when the NAPL first hit
10 the water table, more up in this area, it began to laterally
11 spread within the water table through the process that I was
12 describing to you yesterday. It begins to pool when it hits
13 that wet soil, and then it begins to migrate laterally along
14 those little laminar beds of sand that are embedded in the
15 silty clay and eventually spread down to this southern area.

16 Well, it can't spread from the point of release to that
17 southern area without leaving tracks behind. As it flows
18 through the soil, even within the water table, it coats the
19 soil, and it leaves contamination behind. And given that, EPA
20 came to the value judgment that these two areas are
21 interrelated, and, hence, there must be a region of
22 contamination between them as well. And so they, in effect,
23 connected the dots and said, "This is all just one continuous
24 region of contamination." And I think, given what they knew
25 and what they could reasonably infer, that it was the correct

1 judgment for them to come to.

2 Q And this figure from the ROD, I believe, Dr. Powell, you
3 said is the government's final decision on the contamination
4 of the Lockwood site; is that correct?

5 A It's their final mapping of the source area, yes.

6 Q So is this larger version of the northwest corner the
7 area that Soco is ultimately going to be responsible to clean
8 up?

9 A Yes, it is.

10 MR. LYNCH: Pull up, if you would, please, a page
11 from the FS report, 3051, page 812. And if you could zoom in
12 on the area around PT-02? Right there.

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 MR. LYNCH: Yep. Thank you.

15 BY MR. LYNCH:

16 Q Dr. Powell, you talked about, in developing your mass
17 calculations, dividing the soil into layers. This is a
18 cross-section of a portion of the northwest corner, correct?

19 A That's correct.

20 Q Could you tell us -- you had the area from the ROD being
21 the total area. How did you decide how to divide the
22 subsurface into layers when you were developing your mass
23 calculations?

24 A Well, anytime you do this kind of discretization,
25 breaking up the data into different pieces, you have to

1 consider a number of different factors: What's the nature of
2 the soil? There's a distinct difference between the vadose
3 zone where the soils are unsaturated and the groundwater below
4 the water table where they're saturated, for instance. And so
5 my first layer that I used in the mass calculation were the
6 samples from the vadose zone. So that boundary was between
7 zero and roughly 4 feet below ground surface. And there are a
8 series of samples that they have collected in the soils up
9 here in the vadose zone that I then used to define the mass
10 within that first layer of the calculation.

11 They also did sampling within the water table. Typically
12 on 2-foot intervals, 4 to 6 feet, 6 to 8 feet, 8 to 10, 10 to
13 12. There was no real consistency in each bore hole as to
14 where they sampled, so sometimes they'll sample the higher
15 portion, sometimes the lower portion, sometimes both.
16 Sometimes it's a sample over a 4-foot interval, not a 2-foot
17 interval, so those data have to be sorted and mixed and
18 matched to decide the layering.

19 Ultimately I decided there was enough information to
20 define two distinctive layers within the water table for the
21 silty clay unit, so I drew a boundary approximately through
22 here and here, which defined samples that were taken from 4 to
23 8 feet and from 8 to 12 feet, which is approximately the
24 bottom of the silty clay, and so I collected all of the
25 samples in those intervals, grouped them together,

1 individually estimated the mass in each of those layers.

2 And then, finally, there were few, a few, but relatively
3 fewer samples taken in the sand and gravel unit below 12 feet.
4 That's this deeper layer down here. And I treated that as one
5 layer in the mass estimates. So ultimately I had four layers,
6 and it was really guided by where they did testing, where I
7 had enough data that I could do a reasonable estimate of the
8 mass in each layer. There's no point having too many layers
9 and then not ending up with any data points in a layer because
10 then there's nothing to estimate from. And so it's a value
11 judgment that you have to make when you're sorting the data
12 and doing this kind of estimate.

13 MR. LYNCH: Close out of that, Julianne.

14 THE COURT: Is this a place where we could break for
15 a minute?

16 MR. LYNCH: Certainly.

17 THE COURT: We're going to be in recess here.

18 THE LAW CLERK: All rise.

19 (Recess taken from 09:33:21 to 09:53:36.)

20 (Open court.)

21 (Jury present.)

22 THE COURT: Please be seated.

23 You may continue, Mr. Lynch.

24 MR. LYNCH: Thank you.

25 ///

1 BY MR. LYNCH:

2 Q The first thing, Dr. Powell, during the break somebody
3 asked me -- mentioned that you had used the term
4 "discretization" a few times and asked me what it meant. I'm
5 at a loss. Can you tell us what "discretization" means?

6 A It simply means taking something large and breaking it up
7 into smaller pieces. For example, I took a 25-foot-aquifer
8 and broke it up into four layers. That would be a form of
9 discretization, so that's all it simply means.

10 Q And I believe you said, Dr. Powell, that it was a value
11 judgment as to how you chose those layers. What was your
12 judgment based on?

13 A It was based first on the observation that there's a
14 distinct vadose zone, unsaturated zone, versus the aquifer.
15 There are two distinct soil layers within the water table.
16 There's the silty clay, which is the first unit from 4 to
17 approximately 12 feet below ground, and then there's the
18 deeper sand and gravel. So I observed that there's at least
19 those three discrete layers. And then, finally, within the
20 silty clay, there was considerable sampling done from both 8
21 to 12 feet -- or 4 to 8 feet and 8 to 12 feet, and the
22 concentrations found between those two intervals tended to
23 vary quite a bit. There was much higher levels of
24 contamination found in the 4- to 8-foot range than there was
25 in the 8 to 12, and so I felt it was appropriate to separate

1 those samples along those two depth intervals and estimate the
2 mass separately between them.

3 Q Doctor, could you have divided it differently?

4 A Sure. There's a thousand ways you can slice and dice the
5 data.

6 Q And that would change your result, I take it?

7 A Every different way of chopping the data up is going to
8 give you a slightly different result.

9 Q Is there a danger in dividing it too finely, making too
10 many sections?

11 A Well, you wouldn't want to subdivide it so fine that you
12 end up with a lot of units that don't have any data, because
13 then you don't have anything from which you can estimate, so
14 you wouldn't want to say, well, I'm going to take 1-foot
15 layers when the samples are being reported on 2-foot
16 intervals, for example, or you wouldn't want to subdivide
17 layers so that you end up with no data points in the layer
18 that you can do an estimate.

19 Q Would it also change your conclusion or your number,
20 estimate, on the mass if you had used the older depiction of
21 the northwest corner from the RI addendum as opposed to the
22 final one that was shown in the ROD?

23 A Yes, that has some impact on an estimate of the mass.

24 Q How much of an impact would that have?

25 A Well, if I use the map of the northwest corner source

1 area as shown in the RI addendum and I assume that between the
2 larger northern area and that small southern area, that
3 there's absolutely nothing there, there is nothing but clean
4 soil, the total mass of perc that I would estimate was
5 released would be about 200 gallons, so something a little
6 over 300 would be reduced to 200 gallons.

7 MR. LYNCH: Can you please pull up a page from,
8 Illustrative, now, Exhibit 3878?

9 (Discussion off the record at counsel table.)

10 MR. LYNCH: Exhibit 3878-0117.

11 DOCUMENT TECHNICIAN: (Complied with request.)

12 BY MR. LYNCH:

13 Q Can you tell us what this table depicts, Dr. Powell?

14 A This shows the volume in each of the segments that we
15 considered in the mass estimate, the volume of perc and of the
16 principal breakdown products, TCE, PCE, vinyl chloride, that
17 were in each segment. So the first one with the yellow
18 highlighting, for example, is the amount of perc and the other
19 chemicals in the groundwater between the Coulson ditch, which
20 is a drainage ditch just downstream of the property, which,
21 it's the amount in groundwater between the Coulson ditch and
22 the Yellowstone River, both the amount that's in the water and
23 the amount that's absorbed into the aquifer that the water is
24 flowing through. And these are all in gallons. You total
25 them up, and there's about 30, just a little over 32 gallons

1 of perc in the groundwater zone in that region.

2 Similarly, as you go down through the other areas, the
3 next one is an estimate in the northwest corner area, how much
4 was in the groundwater.

5 The third with the blue highlighting is an estimate of
6 how much was in the soil in the northwest corner area.

7 The so-called total is just the sum of all of those, and
8 then, finally, at the bottom, with the gray highlighting, is
9 an estimate of how much is in the sand and gravel aquifer.

10 Q Why did you separate that out from the total?

11 A It's a unit where we have far less data. There's only a
12 few soil samples that were collected in that deeper unit, and
13 so it's -- our ability to estimate mass accurately there is
14 less so. There's a bigger confidence interval around any
15 estimate that you're going to make in the sand and gravel
16 because we have so many fewer data points, and, for that
17 reason, I labeled it as greater than 50 gallons, but even that
18 is an estimate. I mean, it could be less than 50 gallons. It
19 could be greater than 50 gallons.

20 I think the data is clear; there is a DNAPL condition in
21 the sand and gravel aquifer. Concentrations are very, very
22 high in the groundwater in this region. I don't think the
23 data, though, is really sufficient to do a very accurate
24 estimate of the mass in that, in that region, so I separated
25 it out as a separate number from the others.

1 MR. LYNCH: Take it down, Julianne.

2 DOCUMENT TECHNICIAN: (Complied with request.)

3 BY MR. LYNCH:

4 Q Dr. Powell, have you compared your mass estimates against
5 other estimates of the mass of contamination at the Dyce
6 Chemical site?

7 A Yes. Whenever you do something like this, you always
8 want to ground-truth it against other like estimates that have
9 been made to see if it's similar or differs, and, if it
10 differs, why does it differ? Perhaps my numbers need to be
11 adjusted, so you always want to consider that.

12 Q Okay. I believe we heard earlier that there was a mass
13 estimate, a rough mass estimate done by contractors for the
14 EPA in the 1999 Lockheed Martin report. Did you compare your
15 mass estimate against that one?

16 A Yes, I did.

17 Q And what were your conclusions?

18 A Well, their estimate was based on a little bit of data
19 and an awful lot of deductive reasoning. They estimated how
20 much was in the groundwater as perc. They estimated how much
21 had previously been in the groundwater as perc but degraded
22 into other chemicals. They estimated how much might have
23 already been lost through complete degradation, and, from
24 that, they concluded that they were dealing with a large
25 source area; there must still be a source up, somewhere

1 further upstream in the aquifer that is creating the
2 conditions they were seeing.

3 And with all of that, which, arguably which was a little
4 bit of data and a lot of deduction, they concluded there was
5 about 200 gallons in the original release.

6 Q And if that was just a preliminary estimate for
7 discussion purposes, why did you consider it or compare it
8 against your mass estimate?

9 A Well, it was a data point. I mean, I think they were
10 reacting to the fact that the conditions that they saw in the
11 aquifer suggested that there was a large release. I don't, I
12 don't think I would say that their number was a particularly
13 accurate estimate because it was based an awful lot on
14 guesswork on their part, deduction on their part. Certainly
15 not as accurate as some of the estimates that can be done
16 today with all of the testing that's been done, but it is a
17 data point for comparison.

18 MR. LYNCH: Julianne, could you please pull up
19 Admitted Exhibit 4400? And please go to page 31 of that
20 exhibit.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. LYNCH:

23 Q Dr. Powell, this is a report from ATC that Mr. Sullivan
24 was speaking about when he was here testifying the other day.
25 Do you understand that ATC also did mass estimates for soils

1 in the northwest corner?

2 A Yes, that's correct.

3 MR. LYNCH: If we'd please turn to page, I believe
4 it is, 43 of this exhibit? And please pull out the fifth
5 bullet point.

6 DOCUMENT TECHNICIAN: (Complied with request.)

7 BY MR. LYNCH:

8 Q It states that the mass of CVOCs within the vadose zone,
9 zero to 5 feet below ground surface, was estimated to be
10 between 750 and 1,550 pounds.

11 The first question, Dr. Powell, is, What are CVOCs?

12 A Chlorinated volatile organic compounds; essentially perc,
13 TCE, DCE.

14 Q Assuming it was all perc, how many gallons would 750 to
15 1,550 pounds of perc be?

16 A It would be approximately 55 to 115 gallons of perc.

17 Q Did you review the data and calculations underlying ATC's
18 mass estimates?

19 A Yes, I did.

20 Q Okay. And how do you -- how do they compare to your mass
21 estimates?

22 A Well, they're comparable to my estimates only to a
23 limited degree. As this report stated, their estimate was
24 only for the vadose zone, zero to 5 feet. I had an estimate
25 from zero to 4 feet, so it's not quite apples and apples, but

1 it's close.

2 Their estimate is based on sampling data that they
3 collected, and I used that same sampling data as part of the
4 information I considered. Their methodology for estimating
5 the mass is essentially the same as I used, using the
6 footprint, taking the average concentration within the
7 footprint, multiplying it by the volume, hence the mass of
8 soil and getting the number. So methodologies were
9 comparable.

10 Their estimate is not comparable to my total number
11 because I was looking not just at what's in the vadose zone
12 but what's in the water table below it and what's in the
13 aquifer as dissolved product in the groundwater. So it's a
14 little different. The comparable number from my mass estimate
15 to their numbers, I estimated roughly 32 gallons in the vadose
16 zone as compared to their 55 to 115 gallons, so my number was
17 a little smaller than theirs.

18 MR. LYNCH: Okay. And if you would please go to
19 page 60 of that same exhibit; 4400, page 60?

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. LYNCH:

22 Q Dr. Powell, this is a figure -- yeah, please blow that
23 up.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 ///

1 BY MR. LYNCH:

2 Q Does this figure represent how ATC decided to divide the
3 northwest corner source area in conducting their mass
4 estimates?

5 A Yes. This is how they discretized the footprint of the
6 source area.

7 Q So they sliced it up horizontally whereas you had done it
8 vertically?

9 A Yes. They're only looking at one layer. I was looking
10 at four layers, moving down vertically through the aquifer,
11 but the one layer they looked at, they sliced it up and did
12 their estimates this way.

13 Q Did you look at any other measurements or calculations
14 that you compared your mass estimates against?

15 A Yes. I considered information that ATC had published on
16 how much they actually recovered from the vadose zone when
17 they ran their remediation system. Of all of these estimates,
18 that's probably the most reliable of all in understanding how
19 much is really there, because how much you're pulling out of
20 the ground is a real number. It's not an estimate based on
21 data.

22 MR. LYNCH: Let's pull up again the same exhibit,
23 4400, page 43, again. Please pull out the fourth bullet
24 point.

25 DOCUMENT TECHNICIAN: (Complied with request.)

1 BY MR. LYNCH:

2 Q This is again the ATC report, and the last sentence
3 states, "The total mass of CVOCs removed between October 12
4 and December 17, 2004 is approximately 350 pounds."

5 Was that measured through the vapor extraction system
6 that Mr. Sullivan was talking about the other day?

7 A Yes, that's correct.

8 Q And 350 pounds, assuming it was all perc, how many
9 gallons of perc would that be?

10 A It's about 25 gallons.

11 MR. LYNCH: Can we go to admitted Exhibit 3826,
12 page 1?

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. LYNCH:

15 Q Dr. Powell, this is another document that Mr. Sullivan
16 was talking about, another communication from him to the EPA.

17 Please go to page 9 of this exhibit.

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 MR. LYNCH: And this document is dated August of
20 2005 whereas the last one was dated January of 2005.

21 Please pull out the paragraph that starts 4.A.

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 BY MR. LYNCH:

24 Q The last sentence states, "As of April 2005, estimated
25 VOC mass removal rates were relatively steady at approximately

1 100 pounds per month with a total cumulative mass removal of
2 approximately 780 pounds in six months of pilot operation."

3 Is ATC here saying that they pulled out 780 pounds
4 essentially of perc from their vapor extraction system?

5 A Yes. From the beginning of its operation in November of
6 2004 through April of 2005, they ran it continuously and are
7 reporting a total of 780 pounds of perc being recovered.

8 Q And how many gallons of perc would that be?

9 A It's approximately 60 gallons.

10 Q Am I correct that that vapor extraction system is still
11 running today?

12 A To the best of my knowledge, yes.

13 Q And if it is, it's still pulling perc out of the soil in
14 that northwest corner area?

15 A As far as I'm aware, it is.

16 Q Now ATC, in their report, stated they pulled out, at
17 least as of April 2005, 60 gallons, roughly 60 gallons of perc
18 in the first 5 feet of soils. I believe your estimate was
19 there was 32 gallons of perc in the first 4 feet of soils.
20 Does that difference cause you to question at all the accuracy
21 of your mass estimate?

22 A It really doesn't. I mean, it's very common, in my
23 experience, that when you take soils data and try to estimate
24 how much contamination might be there, that inevitably you
25 understate. We've been running a similar remediation program

1 in California to recover carbon tetrachloride from soil, and
2 what we got out as of the end of last year is almost four
3 times what we initially estimated might be there, so these
4 kinds of differences between a real remediation process and
5 what you've estimated at the front end are pretty common.

6 Also, the 32 gallons I estimated is only the first
7 4 feet. The soils data from the northwest corner area shows
8 that as you begin to approach and get right into the very top
9 of the water table, things become much more contaminated, and
10 as that water table is cycling up and down over the season,
11 that very contaminated zone may be saturated, in which case
12 you're not recovering much from it, or, as it drains down, you
13 start to get some recovery from that zone.

14 So I think the differences between what ATC is reporting
15 and what I estimated in part reflect the fact that it's likely
16 achieving some treatment of the soils below 4 feet, perhaps
17 down as deep as 5 or 6 feet into the soil, and that's not
18 really part of that 32-gallon estimate.

19 Q All right, Dr. Powell. We've talked about what the
20 chemical signature of perc in the northwest corner is, the
21 fact that it's spread out over a significant area, and the
22 mass, the amount of perc you've estimated is down there.
23 Based on those factors, have you formed any conclusions as to
24 how significant of a contribution the northwest corner soil
25 contamination is contributing to the contaminated groundwater

1 plume that's coming off the Dyce Chemical property?

2 A Well, if you consider the different areas where
3 contamination has been found, I think it's pretty clear the
4 northwest corner is, to coin a phrase to use, it's the
5 800-pound gorilla at this site. It is the big primary source
6 area of contamination that's affecting groundwater at this
7 site.

8 Q And what leads you to conclude that?

9 A Well, I've done an analysis of how much contamination is
10 being released from that area versus other areas of the site.
11 I mean, I think just a simple inspection of the data, when you
12 look at the concentration ranges that are being found there
13 and over how big an area they're being found, both in soil and
14 groundwater, it's apparent that there's much more mass of perc
15 in the soil and in the groundwater in that area than there is
16 upstream. The areas where it's been found upstream have been
17 much more localized and not nearly as large.

18 But I've also done some just rough calculations as to how
19 much mass is being contributed to the groundwater in the
20 northwest corner area versus an area just upstream of it, and
21 those calculations suggest that if you look at the total
22 amount of perc moving through the aquifer, for example, in the
23 vicinity of the catch pond versus just downstream in the
24 northwest corner area, there's almost a ten-fold increase in
25 the amount of perc moving through the aquifer from that, over

1 that short distance.

2 MR. LYNCH: Maybe, Julianne, let's pull up
3 Illustrative Exhibit DD144.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. LYNCH:

6 Q And could you explain what this figure is, Dr. Powell?

7 A It's just a caricature indicating what I recently was
8 just a moment ago speaking of. I essentially did an estimate
9 of the amount of perc that is migrating through the aquifer,
10 approximately here, upstream in the northwest corner, and then
11 the same calculation down here through the northwest corner
12 area. And when I did that, I concluded that looking at one
13 number versus the other, there's a relative difference of
14 about 10 to 1, and it was completely consistent with what I
15 concluded just from an inspection of the data. The northwest
16 corner is a very big source area as compared to what's
17 upstream.

18 Q You have a 10-to-1 ratio in the figure. From your
19 calculations, can you remember the absolute amount of perc
20 that's coming off the northwest corner compared to the
21 upstream areas?

22 A No, you can't. All you can really do is determine the
23 relative differences between those two areas.

24 Q Can you briefly tell us why that is?

25 A Well, in order to do these kinds of estimates, you're

1 using three types, three pieces of information. One is the
2 concentration of perc in the groundwater. We know that pretty
3 well. There's been a lot of testing. We have wells. That's
4 been measured. We also need to know the width of the plume
5 and the thickness of the aquifer. That's another factor
6 that's used. And again, we know that pretty well. It's been
7 mapped as it's depicted on this drawing and some of the EPA
8 drawings, and there's been a lot of borings, so we have a good
9 idea how thick the aquifer is.

10 What we don't know very well is how much groundwater is
11 actually flowing through this area. There have been varying
12 estimates of that in reports by different contractors. Tetra
13 Tech estimated that the groundwater is flowing through this
14 area at a rate consistent with a permeability of about 70 feet
15 per day. Groundwater flow is estimated as the product of a
16 permeability and a slope of the water table.

17 Other permeability estimates in the area, though, range
18 from as low as .2 feet per day to as high as 600 feet per day,
19 so there's a very, very large range of estimates.

20 As far as I'm aware, no one has actually done an aquifer
21 pump test here in this location, and without a pump test, no
22 one really knows for sure what the permeability of these sands
23 and gravels are, and, hence, you really can't estimate
24 precisely how much groundwater flow is moving through this
25 area. So in that sense, these estimates of these mass fluxes

1 are not intended to be accurate in an absolute sense but only
2 in a relative sense one to the other.

3 And I say that because I think it's reasonable to believe
4 that between these two lines, these two red lines that I've
5 drawn on the screen, the groundwater flow, whatever it is, is
6 approximately the same because there's no one adding or
7 subtracting groundwater in between these two locations. No
8 one is pumping a well out there, for example.

9 So whatever the true number is on the groundwater flow,
10 it should be approximately the same at both locations, and,
11 hence, the comparison of one transect versus the other, one
12 line versus the other is valid even though we don't know the
13 precise groundwater flow estimate. And we really won't know
14 that unless someone does a pump test.

15 Q Just so I make sure I understand, Dr. Powell, what was
16 your ultimate number for how many -- how much perc is coming
17 off of the northwest corner?

18 A I believe it was about 1,500 grams per day, if I remember
19 correctly.

20 Q And you're telling us you can't state with scientific
21 certainty that that's the actual amount that's coming off the
22 northwest corner?

23 A No. It could be more. It could be quite a bit less than
24 that. I think we just don't know because no one has done an
25 actual aquifer test to measure the groundwater flow.

1 Q But does that affect the legitimacy of the calculation as
2 showing a ratio of perc that's coming off the northwest corner
3 source area as opposed to what's coming from the upstream
4 source areas?

5 A No, it doesn't, in that whatever the flow rate, true flow
6 rate is, it's the same at both locations. So if we were to
7 adjust it downward, you'd adjust at a comparable amount at
8 each location so the ratio of the flows, one to the other,
9 would remain exactly the same.

10 Q All right. Dr. Powell, we've talked about the northwest
11 corner chemical signature and size and your recent mass flux
12 calculations. I'd like to turn now and talk about how that
13 information supports the basis for your conclusions that the
14 northwest corner resulted from a bulk spill of perc in the
15 loading and unloading area. I know you've said we've got a
16 lot of pure perc in the northwest corner. Did you consider
17 the possibility that someone just dumped perc right in the
18 northwest corner itself?

19 A Yes. That's certainly a possibility that would have to
20 be considered.

21 Q And did you conclude that was a likely cause for the
22 northwest corner contamination?

23 A I think it's unlikely that that was the cause.

24 Q And why is that?

25 A Well, first, having read many depositions of former

1 employees, no one that I'm aware of --

2 MR. GROSSBART: Your Honor, I'm going to object to
3 him talking about depositions. He can talk about what he saw
4 in the courtroom, but he can't talk about what he's read in
5 depositions.

6 THE COURT: Is it something that he's listed he
7 relied on?

8 MR. LYNCH: Yes, sir.

9 MR. GROSSBART: He's listed every deposition that
10 was ever taken.

11 THE COURT: Well, I'm going to overrule it.

12 THE WITNESS: Having reviewed testimony of many
13 employees, I didn't find any instance where employees were
14 reporting dumping of chemicals down in that portion of the
15 property. Had there been dumping, I did not observe, on any
16 of the photographs, any discrete area -- a pit, for example --
17 that would have been an obvious place that chemicals might
18 have been dumped. So in my experience, when you have this
19 kind of random disposal in the back 40, so to speak, it
20 creates a region of contamination that is not discrete in one
21 area, and the perc source that's been identified here is
22 pretty discrete and in a very limited area.

23 The facility handled many chemicals. Perc was only
24 a small part of everything they handled, and if there were
25 drums coming back to the facility that had chemical residue in

1 them and they were being dumped on the ground, it's illogical
2 to me that they would have only dumped the perc residue but
3 nothing else ever got dumped out there, and we don't really
4 find other chemicals out there other than perc. We don't
5 find, for example, any BTEX out there in the soil.

6 And then, lastly, perc is a valuable product, and
7 there's a lot of perc out there, at least several hundred
8 gallons out there. It's illogical to me that a company that's
9 in the business of selling perc would be, in effect, pouring
10 fresh product on the ground. It would be like pouring money
11 out on the ground.

12 For those reasons, I think it's unlikely that this
13 release occurred as a result of a pattern of dumping that
14 occurred out in that area.

15 BY MR. LYNCH:

16 Q Well, what makes you -- let me back up.

17 You testified that you believe it's predominantly pure
18 perc down there and a lot of it. Do you have an understanding
19 of where on the site bulk volumes of pure perc product were
20 kept?

21 A They were loaded and unloaded in the unloading area up
22 near the warehouse, and they were stored in tanks in the tank
23 farm and in drums in the warehouse.

24 Q And you've testified that you've assessed a lot of these
25 sites over the course of your career. In your experience,

1 where in such a facility is there most likely to be a release
2 of a large amount of pure-phase product?

3 A The most likely location is going to be in the loading
4 and unloading area. I mean, a secondary location could be
5 where it's stored in tanks, but catastrophic failures of tanks
6 that release all of the product to the ground are very, very
7 rare in my experience, so the highest probability would be in
8 the loading/unloading area.

9 Q Have you seen any indication during trial this week, in
10 the testimony you've heard and the documents we've seen, that
11 at the Dyce site, the bulk perc storage tank was ever outside
12 of secondary containment?

13 A No. As far as I'm aware, it was always inside the tank
14 farm area which was contained within the berm.

15 Q In your opinion, how would, then, a spill of a bulk
16 product in the loading/unloading area get to that northwest
17 corner?

18 A Well, in the period prior to 1981, the stormwater runoff
19 and any chemicals spilled within that same area, the unloading
20 area, would have flowed off to the west to a ditch that was
21 constructed along the rail siding and ultimately through that
22 ditch off to the northwest and down into the northwest corner
23 area. That would have been the pathway for any large spill to
24 have reached the northwest corner.

25 MR. LYNCH: Okay. And let's pull up the 1977 photo,

1 Exhibit, Admitted Exhibit 5024. Can you zoom in on the area
2 just above, north of the berm and then down to the south,
3 below the lower warehouse?

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 MR. LYNCH: That's good.

6 BY MR. LYNCH:

7 Q Can you point to the pathway you're referring to,
8 Dr. Powell?

9 A The loading and unloading would have occurred at
10 approximately this area of the property, and anything released
11 would have flowed down past the small warehouse to the rail
12 siding and then, via the ditch on the east side of the siding,
13 ultimately down here into the northwest corner area.

14 Q Now as we've drawn that circle on the northwest portion
15 of this, is that actually the northwest corner area?

16 A It's close. I would have to see the EPA's mapping of it
17 to be sure. It's not shown on this map, but it's down in that
18 vicinity.

19 MR. LYNCH: Can you zoom out, please, Julianne?

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 MR. LYNCH: Actually, let's pull up Illustrative
22 Exhibit DD098. And focus in on -- just pull up the entire
23 picture portion of it, please.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 ///

1 BY MR. LYNCH:

2 Q This is that same 1977 photo. You've labeled some
3 features on this, Dr. Powell. Can you describe those for me?

4 MR. GROSSBART: Excuse me, Mr. Lynch. Can you tell
5 me what number this is?

6 MR. LYNCH: DD098.

7 MR. GROSSBART: Thank you.

8 THE WITNESS: We've labeled some of the, some of the
9 features at the facility. The loading/unloading area is up
10 here. The ditch, which is the blue line that flowed from that
11 loading/unloading area down to the northwest corner. The
12 green image on the upper left portion of it is the boundary of
13 what EPA identified as the perc source area in the northwest
14 corner. And, of course, we've labeled the berm, the catch
15 pond, and a couple of the borings and monitoring wells that
16 have been drilled down in that area just to the west of the
17 catch pond.

18 BY MR. LYNCH:

19 Q Okay. And, Dr. Powell, what causes you to believe that a
20 release or a spill of bulk perc in the area you've indicated
21 with the red dot there wouldn't simply flow into the tank farm
22 that's bermed?

23 A Well, with a berm along the south side of the tank farm,
24 there was no way for water to flow down into the tank farm.
25 It would have been trapped by the berm, and it would have then

1 had to flow off to the west until it encountered the ditch.

2 Q How do you know there's a berm on the south side of the
3 tank farm?

4 A Well, you can see it on some of the aerial photography
5 over this time period. I've reviewed a number of the photos,
6 and in some it's visible, and in some it's masked by shadows
7 from the buildings. On many of the photos, the berm is
8 visible. And I've also heard testimony from employees that's
9 been consistent in stating there was a berm along that portion
10 of the property in the late 1970s up until, I believe, around
11 1981.

12 Q And admittedly it's a somewhat poor-resolution quality
13 photograph, but, Dr. Powell, can you see any portion of the
14 berm in this '77 photo?

15 A Yes, I can.

16 Q And can you indicate that on the photo? The south berm,
17 we're talking about.

18 A It's approximately here, and then it goes into the shadow
19 and you can't see it.

20 MR. LYNCH: You can close out of that, please,
21 Julianne.

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 MR. LYNCH: And why don't we pull up a similar
24 version, marked-up version of the 1975 photo, Illustrative
25 Exhibit DD064.

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 MR. LYNCH: That must be the wrong one. Close out
3 of that one, please.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 MR. LYNCH: Why don't we pull up the actual 1975
6 photo, Admitted Exhibit 5019, I believe. And let's zoom in on
7 the same area just north of the berm, south of the lower
8 warehouse, the little warehouse.

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 BY MR. LYNCH:

11 Q This is the 11/4/1975 photo of the Dyce Chemical
12 facility, Dr. Powell. Can you see any portion of the south
13 berm on this photo as of this date?

14 A Most of it is obscured in the shadow of the building.
15 There is a small area here which I believe is a remnant of the
16 berm, but you really can't see much of it. This area is
17 pretty obscured by shadow. You, of course, can see the berm
18 here along the railroad tracks pretty distinctly outside of
19 the shadow.

20 Q And, Dr. Powell, is there anything else, based on your
21 experience, not being able to see the berm in this photo, that
22 would suggest to you that, in fact, the drainage, during this
23 period of time, was into that ditch running along the east of
24 the rail spur?

25 A Yes. When I visited the site, I, in part, put on my hat

1 or my thinking as a drainage engineer. Earlier in my career,
2 I did quite a lot of drainage stormwater protection work, and
3 so I examined the site in terms of the patterns of drainage:
4 Where is stormwater generated? Where is runoff being
5 generated? Where would it have to go?

6 And I observed that the entire loading/unloading area is
7 pitched, tipped, if you would, so that the runoff flows to the
8 west down to the vicinity of the corner of the small
9 warehouse. All of the runoff from the roofs on the north side
10 of the large warehouse and from the entire roof surface of the
11 small warehouse also goes down onto the ground in this area.
12 So there's quite a lot of impervious surface -- the roofs, the
13 parking lot, the unloading area -- that's going to generate a
14 considerable amount of stormwater runoff that ultimately
15 concentrates right down there in the corner of the small
16 warehouse area.

17 With the south berm in place, there is nowhere for that
18 runoff to go other than via the ditch along the railroad
19 tracks down into the northwest corner, and when you examine
20 various aerial photographs over a period of time, you can see
21 a very distinct eroded ditch that, at times, is much darker
22 than the surrounding soil, so that would be indicative of the
23 fact that the soils are wet.

24 You can also see, in the photographs, the eventual
25 formation of a small delta-like, deltaic deposit of sediment

1 at the bottom of that ditch down as it flows out into the
2 northwest corner area where it's eroding the soil along the
3 ditch as stormwater is running down through it and the soils
4 are being deposited as a small delta-like feature down there
5 where the ditch exits or turns off to the northwest into that
6 low area.

7 So all of those features suggest to me that this ditch
8 was being used to actively convey stormwater from the
9 unloading area. Quite frankly, if the unloading area wasn't
10 putting stormwater down there, there is no other watershed
11 there. It is the only watershed to that ditch that would
12 provide that type of runoff, and it would have been illogical
13 to have constructed the site in this way with a rail siding
14 and a berm and a drainage ditch in between if the intention
15 wasn't to drain the unloading area, because there is no other
16 watershed for the ditch to drain.

17 Q Dr. Powell, how long did this pathway that you've
18 identified from the loading/unloading area out to the
19 northwest corner exist at the Dyce Chemical facility?

20 A It was first constructed sometime in 1974 when they began
21 constructing the berm along the west side of the -- excuse me,
22 on the east side of the rail tracks. The ultimate completion
23 of it appears from the aerial photography to have been
24 sometime in 1975 when they completed the berm and the south
25 portion of the berm. And so from that time up until very

1 early in 1981 when they reconfigured the berm, this ditch
2 would have been there and been conveying runoff or any spilled
3 chemicals from the unloading area down into that northwest
4 corner.

5 MR. LYNCH: And, Julianne, would you please pull up
6 Illustrative DD109?

7 DOCUMENT TECHNICIAN: (Complied with request.)

8 BY MR. LYNCH:

9 Q This is a marked-up version, Dr. Powell, that you've
10 marked up of the June 2, 1981 photo.

11 Thank you, Julianne.

12 Could you please discuss the changes that you were
13 referring to?

14 A Well, this shows the configuration of the site after the
15 berm was reconstructed. The original berm that existed up
16 until 1981, you can see on the photo a remnant of it still
17 down through approximately this area. And just to the west of
18 that, the blue line depicts the old stormwater ditch that
19 formerly would have conveyed water out this way into the
20 northwest corner but now, with the reconstruction of the berm,
21 is conveying stormwater into the new catch pond.

22 And so the reconstruction of this area, particularly the
23 reconstruction of the berm, caused any runoff from the
24 unloading area, as of the completion of this project, to now
25 be trapped in the catch pond rather than go to the northwest

1 corner.

2 Q And, Dr. Powell, do these changes to the Dyce Chemical
3 facility in 1980 to '81, does that give you an opinion as to
4 the time frame for when the spill you believed caused the
5 contamination in the northwest corner likely occurred?

6 A Yes. Once the site was reconfigured in this way, it
7 would have been impossible for a release in the unloading area
8 to have flowed directly down to the northwest corner. Any
9 release in the unloading area, as of this reconfiguration of
10 the site, would have been trapped within the containment
11 around the tank farm and ultimately ended up down in the catch
12 pond.

13 Q And, Dr. Powell, before we leave this topic, the
14 configuration that existed at the site prior to '81 where the
15 ditch drained water from the unloading area out to the
16 northwest corner area, would such a design have been
17 consistent with then-existing industry standards?

18 A It would have.

19 Q And how do you know that?

20 A Well, I have done forensic studies and remedial studies
21 of any number of sites just like this around the country. In
22 the 1970s it was common that areas where you have heavy truck
23 traffic where you were unloading chemicals were paved, in part
24 because, as we heard in testimony earlier in the trial, there
25 was concern with the trucks getting stuck in the mud when the

1 soils get wet. So that type of pavement was pretty much
2 common, standard of practice, in these type facilities in the
3 loading and unloading areas.

4 But you really didn't see containment of those areas as
5 part of the normal way plants were constructed and operated
6 until later in the '80s when it became much more of a concern
7 about releases with the adoption of statutes, for example,
8 like RCRA and Superfund, that companies began to put
9 containment on these loading and unloading areas.

10 Q And, Dr. Powell, during the time the site was configured
11 that way, when the ditch ran from the loading/unloading area
12 to the northwest corner, could small releases of product
13 during routine chemical-handling operations or perhaps rinsing
14 of hoses or drums, could that have caused, in the unloading
15 area, could that have caused what we see in the northwest
16 corner?

17 A No. A small release would never get a DNAPL product like
18 this down there.

19 Q And can you explain why not?

20 A Well, when you release a product like perc onto the
21 ground, the first thing it's going to do is start to wet the
22 pavement. And if there's a large enough quantity, it will
23 begin to flow across the pavement, but along the way in that
24 process, it's creating even more and more wet pavement. So
25 some of what is initially released is simply going to result

1 in a wet spot, and that will then evaporate off and it never
2 will migrate.

3 There's a minimum level that you'd have to release in the
4 unloading area before any perc is going to reach that
5 northwest corner, and certainly small leaks, small releases,
6 are far below that minimum.

7 Q Okay. Have you calculated the volume of perc that you'd
8 need to release in the loading/unloading area to result in the
9 contamination that we see in the northwest corner today?

10 A Yes, I've done some illustrative calculations of that.

11 Q Can you explain how you determined that?

12 A Well, I've looked at a couple of different factors;
13 first, how much might be retained on the pavement. If there's
14 a spill in front of the unloading or the drumming shed, for
15 example, and it flowed to the ditch in the northwest -- the
16 ditch over along the rail tracks, how much would just be
17 retained because it wet the pavement along the way? That's
18 probably a number in the range of 20 to 40 gallons, would just
19 be retained on the pavement, and that would subsequently
20 evaporate off and go no further.

21 As product, then, flows down the ditch to the northwest
22 corner, there's going to be additional loss in part because it
23 will begin to infiltrate into the soils on the bottom of the
24 ditch, and so there's some loss there, and there's also
25 evaporation from the product as it's flowing down the ditch,

1 because it's just a free surface and it will be more of
2 evaporation.

3 The evaporative piece as it's flowing down the ditch I
4 estimated is in the range of about 36 to 40 gallons. How much
5 is lost to infiltration in the soil depends a great deal on
6 the condition of the soil at the time of the release and
7 particularly the wetness of the soil at the time of the
8 release and whether it's frozen.

9 If the soil is very dry, then the perc will infiltrate
10 into the soil, and for these types of silty clays, I've
11 estimated an infiltration rate of about a half an inch per
12 hour. A large spill would only go on for a period of a few
13 minutes, ten, 15 minutes, perhaps, so you're going to lose
14 some. I estimated, if the soil was very dry and perc could
15 freely infiltrate, you might lose 100 gallons or more, 130
16 gallons, perhaps, through infiltration along the ditch, so
17 that comes off.

18 And then finally, once the perc reaches the northwest
19 corner, it's going to pool in whatever low area is down there,
20 and it doesn't immediately go into the ground. The only way
21 it could get underground very, very quickly would be if the
22 soil were so dry that you got desiccation cracking, which you
23 commonly see in clay soils when they get very dry. You'll
24 actually see cracks in the soil. Or if there were animal
25 burrows in the soil. Those sorts of features would allow the

1 perc to very quickly drain below ground.

2 But in the absence of that, if the soil were intact and
3 there were no holes, then it's going to take a while for the
4 perc to get below ground to where it will no longer evaporate,
5 and, in the process, there's going to be additional
6 evaporative losses.

7 I estimated that for a large spill, one of perhaps
8 300 gallons that reach that area, which was one of my
9 estimates of the mass of perc in the ground, you might lose
10 another hundred gallons or so from evaporation before it gets
11 underground.

12 So if you total all of those up, it's very plausible that
13 a large spill in the unloading area, you could lose perhaps as
14 little as 150, perhaps as much as 250 gallons along the way,
15 depending on how much percolates into the soils in the ditch.

16 The reason that number is a bit uncertain is, as I
17 mentioned earlier when we were talking about how perc behaves
18 in the subsurface, is when it encounters wet soils, the
19 ability to percolate through them slows down, and so if the
20 ditch was wet at the time a release occurred, you would get a
21 little loss along the edge of the ditch as it coated the
22 soils, but you wouldn't get a lot of percolation.

23 Alternatively, if the ditch were wet and frozen, you get
24 virtually no percolation at all because perc will not melt
25 ice, and so that would have prevented any percolation.

1 So the loss rates, you know, vary. We don't know precise
2 conditions at the time a release occurred. We don't know the
3 air temperature, for example. That affects evaporation rates.
4 We don't know the wetness of the ditch. That would affect the
5 percolation rate. But a reasonable estimate of the loss
6 between the unloading area and the northwest corner is
7 probably in the range of 150 to perhaps 200, 250 gallons.

8 Q Okay.

9 A And so it gives you a sense of an order of magnitude.
10 It's not a precise number.

11 Q Okay. So how large of a spill would you estimate would
12 have had to have occurred in the loading/unloading area to
13 result in what we have in the northwest corner?

14 A Well, if we're benchmarking it against the 300-,
15 310-gallon estimate of what's there, it would have likely
16 taken a spill of 500 to 600 gallons. If we're benchmarking
17 against the 200-gallon estimate, it would have been a little
18 bit smaller; perhaps 400 to 500 gallons. But it's a number
19 within that range.

20 Q I'd like to ask you a few followup questions about your
21 analysis, Dr. Powell.

22 First, you indicated once the perc pooled in the
23 northwest corner, depending on the conditions, it would take
24 some time to sink into the soil, the subsurface soils. In
25 your opinion, how long would it take perc, once it settled on

1 the surface in the northwest corner, to reach groundwater?

2 A Well, I think in some of my earlier expert reports I
3 commented that it would have been no more than six months. If
4 the soil were dry, and certainly if there were any cracking,
5 any animal burrows, it could have been very quick, a matter of
6 days. If the soil were wet, damp, such as the perc moved
7 relatively slowly, it may have taken a few months, but perc in
8 the vadose zone moves pretty rapidly. A lot of experiments
9 have been done to look at that question, and it goes very fast
10 through dry soil.

11 Q Now I want to talk to you also about the estimations of
12 how much perc would have infiltrated in the soils along the
13 ditch as the spill flowed through. I believe you said there
14 was different factors that affected that. For your
15 calculations, did you assume the soils were wet or dry?

16 A I assumed that they were dry so that the perc would
17 readily infiltrate.

18 Q Did you assume that the soils were frozen?

19 A No.

20 Q So the assumption you based on would have assumed a high
21 rate of infiltration as compared to what might have existed
22 under other conditions?

23 A That's right. If the soils were wet or if they were
24 frozen at the time, there would have been much less
25 infiltration.

1 Q And I believe you said the figure you arrived at for
2 infiltration along the ditch would have been 130-some gallons?

3 A That's right.

4 Q That's not an insignificant amount of perc. Wouldn't
5 that result in DNAPL contamination conditions similar to what
6 we see in the northwest corner?

7 A No, I don't think it would. Even if that number were the
8 actual number, I don't think it would result in a DNAPL
9 condition.

10 Q Why is that?

11 A DNAPL conditions down in the aquifer typically result
12 when you have a concentrated release in one area that is
13 reinforcing so that the first amount of mass that goes into
14 the soil is reinforced by subsequent infiltration, and
15 subsequent infiltration, and subsequent, and it pushes it down
16 deep into the aquifer.

17 The analogy that I used yesterday in talking about a drip
18 irrigation system and why they're so effective in watering
19 soils deeply, that they're dripping, just continuous, more and
20 more water in the same place, you need that kind of condition
21 to cause DNAPLs to migrate deeply into soils and down into
22 aquifers.

23 In the ditch, we had a condition where, if arguably the
24 soils were dry, perc flowed through. It infiltrated, I've
25 estimated, just a tenth of an inch, but, in the porosity of

1 the soil, perhaps a half an inch of the soil became wetted
2 with perc initially. But once the bulk release of perc has
3 flowed through the ditch, it's essentially dry again. There's
4 still a residue of perc in the soil, but there's no perc
5 ponded up on top of that to reinforce that initial
6 infiltration and to push it any deeper into the soil.

7 So once the ditch began to dry out, evaporation
8 immediately begins, and the soils that are very close to the
9 surface that have been contaminated with perc are largely
10 going to lose that perc over a period of time simply through
11 evaporation back to the atmosphere.

12 That's quite unlike the northwest corner, where the perc
13 likely pooled in low areas and the initial infiltration was
14 reinforced by the additional amount in the pool that continued
15 to push it down deeper.

16 Q Now, Dr. Powell, I believe Mr. Sullivan told us earlier
17 in the week that EPA would allow additional testing on the
18 site if it was requested. Have you requested that there be
19 any additional testing on the site to support your
20 conclusions?

21 A No.

22 Q Do you think it would help resolve this matter, to go in
23 and try and test that ditch area today for perc?

24 A I don't think it would.

25 Q And why not?

1 A Well, as I just was describing, I think even assuming
2 that a release did occur down through that ditch, it's
3 unlikely that there's much contamination left there today, so
4 drilling a hole and finding nothing isn't particularly
5 informative. It doesn't really resolve the debate.

6 Also, this area has been heavily reconstructed since the
7 time that ditch was there. The berms were removed. The area
8 was filled. New tank farms were built. It was concreted
9 over. Given all of the construction that's gone on, I think
10 it would be arguable, if I drilled a hole at some particular
11 location, whether I was even sampling the soils that were
12 originally at the bottom of the ditch. I think that would be
13 very difficult to try to pinpoint that to know you were
14 precisely in the right location.

15 Q Have there been any samples collected by ATC, EPA, or any
16 of the contractors that have worked on the site from that
17 historic ditch area?

18 A There was one sample, and I honestly don't remember who
19 drilled the hole, which of the various contractors did it.
20 There was a sample that's called Borehole F, BH-F, on the
21 drawings.

22 MR. LYNCH: Julianne, maybe pull up Illustrative
23 DD070.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 ///

1 BY MR. LYNCH:

2 Q Some markings you've made on the 1975 photo. Maybe you
3 could explain what you're referring to.

4 A Borehole F is this sample location right here. It was a
5 borehole that was drilled through the soil down to the water
6 table. I don't recall that they did any sampling in the soil
7 itself, but they did sample the groundwater at that location
8 and found a very high level of perc in the groundwater; if
9 memory serves me, about 13,000 parts per billion of perc, so
10 it's well up into the range that's indicative of a DNAPL
11 release.

12 Q Dr. Powell, one followup question regarding the
13 loading/unloading area. Based on the testimony you've heard
14 and the documents you've seen this week, if there were an
15 accident during a loading/unloading operation, equipment
16 failure, employee negligence, whatever, how quickly or how
17 long would it take for 500 to 600 gallons of perc to be
18 released?

19 A I'm sorry; I missed the last part of that question.

20 Q How quickly would it take for 500 to 600 gallons of perc
21 to be released?

22 A I think that depends entirely on where the release
23 occurred. There's been testimony, and in some of the
24 documents I've read, that the pump that was used to transfer
25 perc from the tank truck to the bulk storage tank had a

1 capacity of 60 gallons per minute. So if the release occurred
2 somewhere between that pump and the storage tank, then it
3 probably would have been flowing out at the rate of the pump,
4 and that would have taken roughly eight or nine minutes.

5 If the release occurred, though, between the pump and the
6 tank truck, if the hose came loose there and it was flowing
7 from that hose, I don't think I have a good estimate for what
8 that flow rate would have been. I don't think it would have
9 been defined by the pumping rate, because the pump at that
10 point isn't involved. It's just flowing out of the pipe, and
11 I don't know what that release rate would be and how long it
12 would take.

13 Q Could it have been higher?

14 A It could have been higher. It could have been lower. I
15 just don't know.

16 Q One of the other alternative causes that we heard, in
17 opening, the insurance company suggest that resulted in the
18 northwest corner contamination is releases from, you know, the
19 former catch pond. In your opinion, could the northwest
20 corner contamination have resulted from a release of materials
21 from the catch pond?

22 A No, I don't believe that happened.

23 Q And to play devil's advocate here, we've heard some
24 testimony that at least after the 1981 revisions, the catch
25 pond did capture drainage from the loading/unloading area,

1 correct?

2 A That's correct.

3 Q Couldn't the types of occasional releases that have been
4 testified to this week during loading/unloading operations,
5 couldn't that have resulted in an accumulation of DNAPL perc
6 in that catch pond?

7 A Small releases of a few gallons to arguably even
8 50 gallons I don't think would have ever reached the catch
9 pond. They would have been trapped on the surface of the
10 pavement, of the soil. They would have evaporated. They
11 never would have gotten there as a DNAPL. If there were
12 stormwater runoff, some dissolved perc in the stormwater might
13 have reached the catch pond, but I don't believe that a small
14 release of DNAPL could get to the catch pond, certainly not
15 from the unloading area.

16 MR. LYNCH: Okay. And why don't we pull up the 1981
17 photo, Admitted Exhibit 5033. If we could zoom in on the same
18 area we always zoom in on?

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 BY MR. LYNCH:

21 Q Dr. Powell, could you again indicate on this photograph
22 where the loading/unloading area is?

23 A It's up here.

24 Q Okay. And the catch pond?

25 A Approximately here.

1 Q Do you know what the distance between the
2 loading/unloading area and the catch pond is?

3 A Not precisely but, as I recall, it's a few hundred feet,
4 200 or 300 feet.

5 Q And do you know what the soil or the ground surface is
6 between the loading/unloading area and the catch pond?

7 A Once you get outside the immediate unloading area, it's
8 essentially bare soil.

9 Q Any idea how large of a perc spill it would take to get
10 from the loading/unloading area to the catch pond?

11 A Well, I haven't tried to estimate it precisely, but as
12 compared to the estimates I did for the unloading area to the
13 northwest corner -- I thought about this for a while yesterday
14 evening -- it would probably take a release somewhere in the
15 vicinity of 100 gallons or more before you're going to get any
16 significant amount of perc in the catch pond, if it happened
17 in the unloading area.

18 Q All right. Now let's assume that a release as a result
19 of operations somehow got to the catch pond. A release of
20 perc from operations somehow got to the catch pond. Would you
21 expect still to find chemicals other than perc in that catch
22 pond as well?

23 A Yes. The catch pond was a catch pond for the whole
24 operation. All of the chemicals that they used there that are
25 released onto the ground and are transported via runoff are

1 going to end up in that catch pond.

2 Q Based on your listening to the testimony today and review
3 of documents, any understanding of the amount of perc that was
4 handled at the site compared to some of the other chemicals,
5 specifically some of the BTEX compounds?

6 A I don't have a specific knowledge of the volumes of BTEX.
7 I understand it was relatively large volumes of BTEX that were
8 handled.

9 With regard to the perc, I understand they had initially
10 a 1,500-gallon storage tank; later, a 4,000-gallon storage
11 tank; and the deliveries of perc to the site were in
12 quantities commensurate with those tank volumes.

13 Q Now assuming these chemicals, both BTEX and perc, got to
14 the catch pond, I believe you testified yesterday, when you
15 were talking about BTEX, that BTEX floats; is that correct?

16 A Yes. It's an LNAPL, lighter than water. It will float.

17 Q Perc, on the other hand, sinks?

18 A It's a DNAPL. It's a sinker.

19 Q Would the catch pond waters then not have been expected
20 to have any BTEX in them?

21 A Well, if there were a release of a large quantity of
22 BTEX, xylene, for example, it's going to flow down to the
23 catch pond. It's going to form a floating oily-like layer on
24 top of the pond, on the top of the water in the pond.

25 Q Is the water in the pond going to have any dissolved BTEX

1 in it?

2 A Oh, yes. BTEX, like perc, is soluble in water, and it
3 will dissolve in the water.

4 Q I'd like you to assume that, contrary to what you had
5 said about whether you think a release of perc could have
6 gotten to the catch pond, assume that small types of releases
7 from the result of operations, whatever chemicals, did get to
8 the catch pond. If the catch pond were then drained, what
9 would you expect the resulting contamination to look like?

10 A I'm not really clear about your question. Are we talking
11 about the contamination left in the bottom of the pond or the
12 contamination in the water that's drained?

13 Q The contamination that would have resulted from the water
14 that was drained.

15 A The water that's drained is going to have a rich menu of
16 everything that's there, similar to the kinds of menu of
17 chemicals that were found in the concrete catch ponds that
18 were eventually built behind the later tank farm. It would
19 just be a rich mix of everything that's there in the facility
20 that was released.

21 MR. LYNCH: Julianne, if you could pull up
22 Exhibit 4811?

23 THE COURT: Let's take another quick break here.

24 THE LAW CLERK: All rise.

25 (Recess taken from 10:57:00 to 11:05:59.)

1 (Open court.)

2 (Jury present.)

3 THE COURT: Please be seated.

4 You may continue.

5 BY MR. LYNCH:

6 Q Dr. Powell, before you on the screen is one of the
7 documents we looked at with Mr. Sullivan yesterday when he was
8 testifying. It's the results of some samples he took in the
9 operational area of the Dyce site.

10 I'd like you to turn to page 2 of that document, please,
11 Julianne, and pull out the last paragraph under "Concrete and
12 Soil Analytical Results."

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. LYNCH:

15 Q This paragraph, Dr. Powell, describes the findings
16 Mr. Sullivan made when he tested that subsequent concrete tank
17 pond on the site, and it states that constituents in either
18 one or both of the concrete samples include ethylbenzene,
19 methylene boride, PCE, and xylenes. Are some of those
20 constituents -- let me back up.

21 PCE is perc, right?

22 A Yes, that's right.

23 Q Are some of the other constituents BTEX compounds?

24 A Yes. Ethylbenzene is the E in BTEX, and xylene is the X
25 in BTEX.

1 Q And you understand, Dr. Powell, that this sample was
2 taken from the very bottom of essentially what was the
3 concrete catch pond?

4 A That was my understanding, yes.

5 Q If chemicals were getting to the historic catch pond that
6 existed on the Dyce site in any appreciable amounts, would you
7 expect to see a similar profile in that historic catch pond?

8 A Well, I don't know that the concentrations would have
9 been precisely the same, but the same general mix of chemicals
10 would have been expected to be found. You should have seen
11 BTEX, perhaps perc, other kinds of chemicals.

12 Q And, Dr. Powell, if they had regularly drained that
13 historic catch pond, is it even conceivable to conclude that
14 each time they drained that catch pond, the only thing they
15 pulled out of it was pure perc?

16 A No. They would have pulled out what was ever in the
17 water in the pond. There was no way for them to physically
18 separate perc from everything else in the water when they
19 discharged water. Everything would have gone with it.

20 Q Now Marvin Johnson came in yesterday and testified that
21 he believes he recalls that there was a pipe in the catch
22 pond.

23 And may I approach, Your Honor?

24 THE COURT: Yes.

25 ///

1 BY MR. LYNCH:

2 Q And I've put up on the easel, Dr. Powell, Marvin
3 Johnson's illustration of how that pipe ran in the catch pond.
4 You can't really tell from that diagram, but do you have any
5 idea how far from the bottom of the catch pond the end of that
6 pipe would have been?

7 A No. I don't think that's something he commented on
8 during his testimony. Not that I heard.

9 Q Did he give you any indication of whether it was at the
10 very bottom?

11 A Well, I recall --

12 MR. GROSSBART: Objection, Your Honor, to this
13 characterization of his testimony.

14 THE COURT: Sustained.

15 BY MR. LYNCH:

16 Q Do you have understanding as to whether that pipe was
17 always, end of the pipe that he believes he saw, was always
18 underwater?

19 THE REPORTER: I'm sorry; Do you have any
20 understanding --

21 MR. GROSSBART: Same objection.

22 THE REPORTER: Wait.

23 Your question? I didn't hear you clearly.

24 MR. LYNCH: Oh.

25 ///

1 BY MR. LYNCH:

2 Q Do you have an understanding as to whether the bottom of
3 that pipe in the catch -- that he believes was in the catch
4 pond was always under the water?

5 MR. GROSSBART: Same objection.

6 THE COURT: Sustained. I don't know that he --
7 well, did he testify to that yesterday?

8 MR. COZZENS: (Nodded head affirmatively.)

9 THE COURT: I don't remember.

10 MR. COZZENS: Yes, he did, Your Honor.

11 THE COURT: Well, go ahead and answer if you have an
12 answer.

13 THE WITNESS: To the best of my recollection, he
14 commented that sometimes the pipe would be underwater and
15 sometimes the water level in the pond was low enough that the
16 pipe was not down in the water.

17 BY MR. LYNCH:

18 Q Given the area of that pond as it existed in the early
19 1980s, how much perc would it take to get even an inch layer
20 of perc, pure-phase perc, in the bottom of that catch pond?

21 A It would, it would take a release of somewhere in the
22 neighborhood of 1,000 gallons, perhaps a little less, that
23 actually reached the pond. Depending on where the release
24 occurred, it may have to be bigger than that to get that much
25 perc to the pond, but 1,000 gallons would create a layer in

1 the bottom of the pond of about an inch of perc.

2 Q It would be a lot of drips and drabs, or even 5-gallon
3 spills of perc, wouldn't it?

4 A I don't think drips and drabs and 5-gallon spills would
5 ever reach the pond in the DNAPL form. To get a thousand
6 gallons back there, you would have to have a very large
7 release, all at once, or it's just not going to get back to
8 the back corner.

9 Q Even assuming that, you know, that the end of that catch
10 pond was an inch or two above the bottom of the catch pond and
11 thousands of gallons of perc had been released into the catch
12 pond, could that perc have drained out of the pond by opening
13 the valve on the pipe that Mr. Johnson described?

14 A No, I don't believe it could.

15 Q And why is that?

16 A Perc is a very heavy liquid as compared to water. It's
17 denser than water. In order for the perc to drain from the
18 pipe, assuming that the pipe was even down in the perc layer,
19 there would have to be enough water pressure in the pond to
20 push that heavy liquid up the pipe all the way to the top.

21 As Mr. Johnson has drawn this pipe, the outside end of
22 it, the one outside the berm on the left, is nearly at the top
23 of the berm. And there's been testimony that the berm was
24 about 5 feet tall. So the maximum water you can pond inside
25 that berm is 5 feet. Any more than that is simply going to

1 spill over and start to flow outside the pond.

2 So the maximum water pressure that you can form on the
3 pond side of that pipe, the end that's sticking down in the
4 perc layer, is comparable to 5 feet of water pressure.

5 Perc is 60 percent denser than water. Water has an
6 actual density of 1 gram per cubic centimeter. Perc has a
7 density of roughly 1.6 grams per cubic centimeter. Five feet
8 of water pressure on the bottom of that pipe would be capable
9 of lifting a column of perc approximately 3 feet up from the
10 bottom of the pond in the pipe, at which point the pressure of
11 perc inside the pipe and the pressure of the water outside of
12 the pipe are in what's called a hydrostatic equilibrium and
13 the perc can't flow up any higher. There is nothing to
14 continue to push it up higher.

15 Three feet of perc in that pipe would put it partway up
16 in the pipe, but it's not sufficient to lift it nearly to the
17 top of the pipe as Mr. Johnson has drawn it here, so even if
18 there were perc in the bottom of the pond and the pipe is
19 sitting in that perc and the pond is completely full of water,
20 there is not enough pressure to push that perc up to the top
21 of that pipe and hence out of the pond.

22 Q Dr. Powell, is there any way that the pure-phase perc
23 that we now find in the northwest corner could have
24 accumulated in the catch pond and simply overflowed the berm?

25 A I'm sorry; could you read that question back?

1 Q Sure. I apologize.

2 Is there any way that pure-phase perc could have simply
3 accumulated in the catch pond and risen up to a level that it
4 would have simply overflowed the berm?

5 A Not unless it was an enormous quantity of perc, because
6 perc settles -- perc is a DNAPL, so it's going to settle to
7 the bottom of the pond. There may be water on top that will
8 eventually overflow, but whatever perc is there in the bottom
9 of the pond below the water layer, perc could never overflow
10 that berm unless the entire pond were full of perc to the
11 point that it was spilling over the top of the berm. And
12 that's an enormous quantity.

13 Q Can you give us an estimate as to the amount of that
14 quantity?

15 A Well, the pond, as it existed in 1981, was about 2,000
16 square feet in size. The berm is 5 feet high, so the product
17 of those two things is 10,000 cubic feet. That's assuming
18 that it doesn't expand beyond the edge of the pond into the
19 lower part of the tank farm, which I expect would have
20 occurred. But assuming it even stayed confined within the
21 boundary of only the pond, you're talking about 75,000 gallons
22 of perc. I mean, it's far in excess of anything that was ever
23 onsite.

24 Q You previously reviewed some of the sampling data from
25 the pond; specifically, the Kaivos testing that was done in

1 1985. Does that in any way inform your opinion as to whether
2 an appreciable amount of perc, DNAPL perc, ever reached this
3 catch pond?

4 A Yes, it does.

5 Q And how so?

6 A Well, if perc had migrated to the pond as a DNAPL, it
7 would have first settled to the bottom of the pond and would
8 have been on the bottom layer of the pond. There was a soil
9 layer sitting on top of the liner in this pond, and so the
10 perc, when it settles to the bottom of the pond, begins then
11 to percolate, to infiltrate down into the soil layer in the
12 same way, over in the northwest corner, it eventually went
13 down into the water table.

14 So an inch, for example, of perc on the bottom of the
15 pond from a 1,000-gallon release would have largely ended up
16 initially down in that -- trapped down in that soil layer, and
17 when Kaivos went in and tested, in 1985, those same sediments,
18 if there had been anything remotely like that in the past,
19 they should have been able to see it in their test.

20 Q Dr. Powell, have you considered the possibility that
21 DNAPL perc simply accumulated in the bottom of the pond, went
22 into the subsurface soils there, and then migrated, simply
23 migrated to the northwest corner?

24 A I don't think that the evidence in this case supports
25 that theory in any way.

1 Q Why doesn't the evidence support that?

2 A Well, it certainly is plausible in my view that if perc
3 accumulated in the bottom of the pond that it could have gone
4 through the bottom of the pond into the soil beneath it. The
5 liner systems that were available back in that era were really
6 not effective in containing something like perc. The better
7 liner systems, high-density polyethylene, for example, that
8 eventually began to be used for these types of facilities
9 really wasn't available until later.

10 So it's plausible that the perc could have gone through
11 the liner system into the ground, but if that had occurred, as
12 I have said several times, it leaves tracks behind. The
13 ground under that pond would be highly contaminated. It would
14 look just like the northwest corner area. When they went in
15 and drilled and tested, they should have seen that high level
16 of contamination in the soil tests that they performed, in the
17 MIP logs they performed, and groundwater samples they
18 collected, and the contamination with regard to groundwater
19 should have been right at the first top of the aquifer, not
20 down deep where they eventually found it in Boring MP-105.

21 So I don't think the data they collected from that area
22 in any way suggested that there was ever a DNAPL release from
23 the pond that went through the bottom of the pond into the
24 soil and, hence, to the water table.

25 Q Dr. Powell, just following up on that, I believe you

1 testified that in MP-105, the location where they found perc
2 near the former catch pond, where was the perc found, the
3 DNAPL indicator found?

4 A At the very bottom of the sand and gravel aquifer in
5 groundwater. There was nothing above that, higher up in the
6 water table or in the vadose zone, that was indicative of a
7 DNAPL perc condition.

8 Q And in the northwest corner, what levels were -- what was
9 the first level where indications of DNAPL perc were found?

10 A It was found beginning about 2 feet under the ground and
11 then all the way down through the aquifer into the sand and
12 gravel unit, continuously.

13 Q Assuming, for argument's sake, that somehow perc had
14 gotten into the ground beneath the catch pond, migrated
15 laterally to the northwest corner, is there any way that DNAPL
16 perc could have moved up through the soils to see the result
17 in the contamination we see in the northwest corner?

18 A Certainly not into the vadose zone. Gravity pulls things
19 down. It doesn't push them up. And the perc arguably, if
20 there had been enough released from the pond, might have
21 migrated in the water table zone to the northwest corner, but
22 it would have left a large region of contamination behind on
23 the way. But once it reached the northwest corner, it could
24 not have then migrated upward, back up towards the surface
25 into the vadose zone in the kind of concentrations that have

1 been seen there today.

2 Q We've seen a lot of photographs in this case, Dr. Powell,
3 that show varying degrees of vegetation along that northwest
4 corner area.

5 And, Julianne, maybe if you could please pull up Admitted
6 Exhibit 5024? You don't need to blow it up.

7 DOCUMENT TECHNICIAN: (Complied with request.)

8 MR. LYNCH: In this area here that I'm referring to.
9 And now Admitted Exhibit 5028?

10 DOCUMENT TECHNICIAN: (Complied with request.)

11 MR. LYNCH: This is the '79 photo that we've looked
12 at, that area.

13 Admitted Exhibit 5033?

14 DOCUMENT TECHNICIAN: (Complied with request.)

15 MR. LYNCH: We're talking about this area in here.
16 And then Admitted Exhibit 5036?

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 MR. LYNCH: In this area in here.

19 BY MR. LYNCH:

20 Q Does the existence of that devegetated area, Dr. Powell,
21 undermine your conclusion that there were no releases of perc
22 from this historic catch pond?

23 A Could you read the question back, please? I'm not sure I
24 caught every word.

25 Q I'll reask it. It was probably a bad question.

1 Does the existence of that devegetated area, does that
2 undermine your conclusion that perc was not released from this
3 catch pond?

4 A No, not at all.

5 Q And why not?

6 A Well, there are very simple and direct explanations for
7 why that area is devegetated. It doesn't require a release
8 from the catch pond to explain why the vegetation has a hard
9 time growing down there.

10 Q What are some of those simpler explanations?

11 A Well, the first and obvious one is Dow Chemical was
12 manufacturing 2,4-D on this site. It's a very potent
13 herbicide. It's a product that you'll commonly find in weed
14 killers like Ortho Weed B Gon, for example. 2,4-D is an
15 active ingredient in that.

16 There was formerly a small impoundment on the west side
17 of the railroad tracks where waste from that operation was
18 apparently disposed. And I believe it was Mr. Naff who
19 testified earlier in the trial that he observed occasional
20 releases from that impoundment, and you can certainly see in
21 the photography areas of devegetated soils leading from that
22 impoundment down into the northwest corner area. So to the
23 degree there's episodic releases of 2,4-D that flow down
24 there, have historically flowed down there, they would
25 certainly contribute to devegetation in that area.

1 Also, when ground becomes very acidic, it's difficult for
2 vegetation to grow, and I believe one of the former employees
3 at Dyce -- I honestly don't recall his name -- yesterday
4 talked about his concern with what he described as sour ground
5 down in that area. That's a euphemism for acidic ground.
6 There was regular unloading operations along the rail siding
7 of tank cars of things like hydrochloric acid that occurred,
8 and it's inevitable, in my experience, in those types of
9 unloading operations, there will be small drips and drabs that
10 get onto the ground. And concentrated hydrochloric acid goes
11 a long way when mixed with stormwater in terms of creating
12 acidic conditions, and any drips along that rail siding,
13 because of the way the drainage was oriented in the late '70s,
14 would have inevitably flowed, in stormwater, down into the
15 northwest corner area. The combination of those two, the
16 herbicides, the acids that might have washed down there, would
17 both contribute to devegetation.

18 In addition, perc, in a DNAPL form, will kill vegetation.
19 I know that because I think I mentioned yesterday I have a
20 client who unfortunately was using it as a weed killer on his
21 parking lot, and now his parking lot is in the middle of a big
22 Superfund site, and he is spending a lot of money doing a
23 cleanup, but they were spraying it to kill weeds. And so to
24 the degree there is a DNAPL release of perc in that area, it
25 will also contribute to the die-off of vegetation. So you

1 have any number of readily available, simple, direct
2 explanations for why vegetation died in that area. It doesn't
3 require pumping of the catch pond to explain it.

4 Q And, Dr. Powell, we've heard testimony this week from a
5 couple of witnesses about an inventory discrepancy of bulk
6 perc in the mid 1970s. Is that consistent with your
7 conclusion that the contamination in the northwest corner most
8 likely resulted from a bulk spill in the loading area of the
9 perc site in the mid 1970s?

10 A Yes, it is.

11 Q And how so?

12 A Well, it's consistent insofar as the volumes that I've
13 estimated would have been required to create the contamination
14 in the northwest corner. Five to 600 gallons likely would
15 have had to have been released to cause the 200 to 300 gallons
16 to be deposited in the soils in that corner.

17 It's also consistent in that a discrepancy during that
18 period of time, if it indeed resulted from a large bulk
19 release in the unloading area, would have naturally flowed to
20 the northwest corner via the drainage ditch along the rail
21 siding, so the volumes are approximately correct, and the
22 pathway existed at that time for the contamination to reach
23 that northwest corner. And so they're consistent in that
24 respect.

25 Q Dr. Powell, based on the totality of the information

1 you've reviewed, your experience, and the testimony and
2 documents you've looked at this week at trial, is there any
3 other explanation for the contamination they found in the
4 northwest corner source area that is as likely as a bulk -- a
5 release of a bulk amount of perc in the loading/unloading area
6 in the mid 1970s?

7 A No, there's not.

8 MR. LYNCH: I have nothing further.

9 THE COURT: Who is crossing? Mr. Grossbart? You're
10 up, at least for 32 minutes.

11 MR. GROSSBART: A couple seconds to get organized.

12 CROSS-EXAMINATION

13 BY MR. GROSSBART:

14 Q I would say, "Good afternoon," but we're not quite there.

15 A Good morning.

16 Q Good morning, Mr. Powell, Dr. Powell. Excuse me.

17 We've obviously met before. You gave a deposition in
18 this case. Do you recall --

19 A Yes --

20 Q -- that?

21 A -- I do.

22 Q I think we were in Minnesota. Good to see you again.

23 THE REPORTER: Gentlemen, we have to go one at a
24 time. Thank you.

25 THE COURT: She's the best in the world, but even

1 they can't take two at the same time.

2 BY MR. GROSSBART:

3 Q All right. I will do my best to slow it down and pause.

4 I guess you will, too.

5 Can we put up -- well, let me just ask you this. Your

6 firm, ENVIRON, has been working with Soco and some of its

7 predecessor-named companies for several years on issues

8 relating to the Dyce plant in Billings; isn't that correct?

9 A There's been work done by other professionals in my firm
10 on the site prior to mine, yes.

11 Q Right. I'm not limiting it to you. I'm limiting it to
12 ENVIRON, the company you are partial owner of.

13 A That's correct.

14 Q All right. And that work goes back to when? 2002 or so?

15 A I don't honestly know. Until I became engaged to work on
16 this, this project, as an expert witness, I wasn't in any way
17 involved in the site, and so I don't know when the work
18 actually began.

19 Q Well, in your expert report, you listed 45 or 50 pages of
20 material that you reviewed in connection with doing your work
21 for this case, right?

22 A Well, I think there was a lot more than 45 or 50 pages,
23 but I listed what I've reviewed.

24 Q No, the list was 45 or 50 pages. Not what you reviewed
25 was 45 or 50 pages.

1 A Okay.

2 Q So you didn't see, in doing that review, all of the other
3 things ENVIRON had done for Soco while the EPA investigation,
4 for example, was pending?

5 A Yes, I believe there was some additional work done by
6 ENVIRON.

7 Q Right. And you saw the work, for example, done by
8 ENVIRON that was attempting to convince the EPA to take a
9 different course than it ultimately did? You saw that, right?

10 A I don't have a specific recollection of that as I sit
11 here today. It's been a long time since I've looked at those
12 reports.

13 Q Who helped you with your work in this case?

14 A Most of the work, the staff support that I received, was
15 by Dr. Mark Hawley. He's an engineer and hydrologist that
16 works in our Arlington, Virginia, office.

17 Q Who else?

18 A There were other members of the professional staff in
19 Arlington that assisted Mark. I didn't work directly with the
20 staff. I worked only through Mark, so I don't know the
21 specific names.

22 Q Did you work with Steve Dielman?

23 A I had asked him questions once or twice in the course of
24 my work, but I didn't have extensive interactions with him.

25 Q Did he summarize materials for you?

1 A Not directly, no.

2 Q Did he summarize them indirectly?

3 A Well, I understand from my discussions with Mr. Hawley
4 that he had previously had discussions with Mr. Dielman about
5 certain aspects of the earlier work on the case, and to the
6 degree those were information that Mr. Hawley was relying on
7 to put together documents for me, it would have been indirect
8 that any input from Mr. Dielman would have been considered.

9 Q All right. So you worked with Mr. Hawley, who in turn
10 worked with Mr. Dielman?

11 A I don't think it's fair to say that Mr. Hawley was
12 working with Mr. Dielman in the course of my personal work on
13 this case, because Mr. Dielman left our firm last year and is
14 no longer a member of ENVIRON. I know Mr. Hawley had a couple
15 of conversations with Mr. Dielman in the last few months to
16 clarify some information that he found in our records.

17 Q Isn't much of your analytical work in this case based on
18 work that's been done previously in this case by others within
19 ENVIRON?

20 A Some of it adapted work that was done previously by other
21 professionals in my firm. Some of it is work where I took
22 previous work product -- for example, the original mass
23 estimates as to how much was in the northwest corner -- and I
24 updated that with further information that I had to produce
25 new estimates.

1 Q That's right. But they were essentially the same -- let
2 me strike that.

3 Let's go to Exhibit 3059, page 121, please.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. GROSSBART:

6 Q Now this is a document everyone is familiar with, and
7 certainly yourself, correct? It's from the ROD, the record of
8 decision issued by the EPA in August of 2005; is that correct?

9 A I believe that's correct, yes.

10 MR. GROSSBART: All right. Now, Neil, could you
11 just enlarge it so we get --

12 DOCUMENT TECHNICIAN: (Complied with request.)

13 MR. GROSSBART: Okay. That's fine.

14 Now why don't you, Neil, scroll or push the picture
15 over so we can see the legend.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 BY MR. GROSSBART:

18 Q And the green areas are -- there's a green area in the
19 legend and a hatched area, but the green signifies, according
20 to this diagram, source area saturated zone soil. I
21 paraphrased it. Do you see that?

22 A Yes.

23 Q Okay. Now let's go back to the diagram. So at least
24 according to the EPA, there are four source areas in and
25 around the Dyce plant, right?

1 A (No response.)

2 Q One, two, three, four green blobs?

3 A (No response.)

4 Q According to the EPA?

5 A I am not quite sure what you mean by the term "source
6 area." I understand they are depicting on here areas in which
7 they believe that the soils on the site exceed their cleanup
8 goals, their remediation targets.

9 Q I mean what the EPA said in the legend that we just saw.
10 There are four of those. Right?

11 A Yes, there are.

12 Q Okay. And when you refer to the northwest corner, you're
13 referring just to this, right?

14 A That's correct.

15 Q And this, this fellow is not the northwest corner, is he,
16 according to you?

17 A It's not what I would normally associate with that term,
18 but I don't know that it's not part and parcel of the same
19 problem. It's in fairly close proximity.

20 Q Is this area explained by the spill that you have
21 suggested occurred and worked its way out to the northwest
22 corner or not?

23 A It may be. I don't, I don't know that the data is
24 completely definitive in that regard.

25 Q So maybe yes? Maybe no?

1 A That's right.

2 Q And this source area, is that explained by the spill on
3 which you base your entire opinion, of which there's no
4 evidence, but that you hypothesized occurred?

5 A You're referring to a spill in the unloading area?

6 Q I'm referring to the spill that we've been here for a
7 week on now, the one that supposedly happened in 1975, '76,
8 '77, in the loading and unloading area and went southwest to a
9 ditch and then northwest to the northwest corner. Is that
10 explained by that alleged spill?

11 A No.

12 Q Whatever it is, something else caused it?

13 A That's right.

14 Q How about that area? Is that explained by the spill,
15 again, that no one has seen or heard -- or recorded, but on
16 which you base your opinion?

17 A I don't think it probably is.

18 MR. GROSSBART: Okay. Would you go, Neil, to
19 Demonstrative 469, page 2?

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. GROSSBART:

22 Q Do you recall the testimony about this demonstrative by
23 Mr. Sullivan on Monday?

24 A I recall Mr. Sullivan's testimony. I don't recall this
25 specific demonstrative.

1 Q Well, just a couple minutes ago you talked about
2 Exhibit 4811 and some soil sampling that was done by ATC in
3 2003. Do you recall that exhibit?

4 A Yes, I do.

5 Q Okay. And that's the situation where, among other
6 things, Mr. Sullivan went into the concrete area depicted on
7 this photo, dug up the concrete and found perc and, to be
8 fair, other contamination immediately underneath there.
9 Right?

10 A I believe that was his testimony, yes.

11 Q Right. And you don't have any reason to doubt those
12 findings, do you?

13 A No.

14 Q And were you provided with this analysis when you did
15 your original expert work in this case?

16 A It probably was information that we had and reviewed. I
17 just don't recall specifically. This is a very large file.

18 Q I understand that.

19 And do you recall whether -- you recall, in doing your
20 expert work in this case, you were required to identify the
21 various documents and things that you reviewed to do your
22 work, right?

23 A Yes.

24 Q And did you list Exhibit 4811, either by that number or
25 its actual title, in your expert report?

1 A Just for clarification, 4811 is --

2 Q Well, we'll put 48- --

3 A -- this specific demonstrative?

4 Q We can put 4811 back up.

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. GROSSBART:

7 Q This thing. This document.

8 A I don't recall. As you stated earlier, there were 40 or
9 50 pages of documents, and I don't have that level of memory.

10 Q Okay. That's fine.

11 You didn't discuss it, however, until today in any of
12 your prior work in this case, did you?

13 A Well, I discussed the fact that --

14 Q My question, sir, is, Did you discuss this particular
15 investigative report by ATC?

16 A (No response.)

17 Q Apart from whether you listed it or not in your
18 attachment, did you discuss it?

19 A I don't recall whether we discussed this specific
20 document. We discussed these types of tests and the findings,
21 such as have been reported here, as being a condition of this
22 area of the plant in the report.

23 Q All right.

24 A I'm certain of that.

25 Q The plant is dirty, isn't it?

1 A There are areas of the plant where there is contamination
2 in soil and groundwater.

3 Q Contamination is all over the place in the plant area,
4 isn't it?

5 A It's found in a few discrete areas, and then it has
6 spread in groundwater to form the plume that's been mapped.

7 Q I'm not talking about just perc and chlorinated solvents.
8 I'm talking about everything. The plant is dirty, isn't it?
9 It's contaminated with all sorts of things?

10 A There is contamination in soil in the plant in some
11 areas. There is groundwater contamination in portions of the
12 plant. I don't, quite frankly, know what you mean by the word
13 "dirty," because that's not a very precise term of art that I
14 would use as a scientist.

15 Q There's a lot -- well, contaminations are high in the
16 plant, and they are of multiple different chemicals?

17 A I would agree there are multiple chemicals, and, in some
18 areas, contamination levels are high.

19 MR. GROSSBART: All right. Would you go back to
20 469, page 2?

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q And the chlorinated solvent contamination, specifically
24 perc, found here, I don't know if you can see it, but we've
25 superimposed the ROD figure right here on this diagram; in

1 other words, the green blob. Do you see that?

2 A Yes.

3 Q Okay. And the perc contamination here is obviously
4 outside that green source area as delineated on the ROD
5 figure. Fair statement?

6 A Yes.

7 Q And do you recall Mr. Sullivan testifying that, in point
8 of fact, if you were to factor in this information, the source
9 area in the main part of the plant would be larger; that
10 without this information, contamination in the plant proper is
11 understated? Do you recall him saying that?

12 A I don't recall him saying that, but I wouldn't disagree
13 with the underlying position that if you incorporate these
14 additional test results, that you would have drawn a somewhat
15 larger boundary there as representing the contaminated area
16 around the tank farm.

17 Q All right. And the EPA didn't have this information?
18 You heard him say that, too, did you not?

19 MR. LYNCH: Objection. Mischaracterizes the
20 testimony.

21 MR. GROSSBART: Well, you heard -- I'll rephrase.

22 THE COURT: Overruled.

23 MR. GROSSBART: Well, all right.

24 THE WITNESS: I don't recall that testimony, but
25 it's my understanding that the borings that ATC drilled that

1 are the basis of this were done after EPA had done their work,
2 and so it probably wasn't information they had and were able
3 to consider.

4 BY MR. GROSSBART:

5 Q Well, the report is dated April 2003. The EPA wasn't
6 done, didn't do its ROD until August of 2005.

7 A But as I recall, the remedial investigation was issued
8 earlier than that. The ROD is the last document in a series
9 of documents that are typically prepared over a period of
10 several years.

11 Q Are you telling us that just because the -- well, first
12 of all, the remedial investigation I think is dated June 2003,
13 so even that one doesn't work, does it?

14 A I don't believe that many of the borings that ATC
15 drilled, as part of their investigation, were incorporated
16 into the EPA's remedial investigation, for whatever reason,
17 whether it was timing or whatever reason, because when I look
18 at mapping that they did of the borings that they drilled and
19 that they used to map, for example, the northwest corner
20 source area, I noted that many of the borings that ATC drilled
21 in that area --

22 MR. GROSSBART: Your Honor, can I get an answer to
23 my question?

24 THE WITNESS: -- are not displayed on their map --

25 THE COURT: Yeah.

1 THE WITNESS: -- so I don't believe they considered
2 them.

3 THE COURT: Listen to the question he asked.

4 Ask it again.

5 MR. GROSSBART: I pretty much forgot it, but I'll
6 start over.

7 BY MR. GROSSBART:

8 Q The remedial investigation is dated June of 2003,
9 correct?

10 A I don't recall the specific month. I'll accept it as
11 correct if you represent it so.

12 Q Well, you're the one who studied all this material. You
13 don't even remember that?

14 A No, I don't remember that specific date.

15 MR. GROSSBART: Okay. Then I'll double check, and
16 let's see if I'm right.

17 (Discussion off the record at counsel table.)

18 MR. GROSSBART: Would you put the first page of 3050
19 on the screen, please, Neil?

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. GROSSBART:

22 Q Okay. So you don't have to take my word for it, right?

23 A Okay.

24 Q And this report done in April of 2003, you heard, was at
25 least not turned over by Mr. Sullivan to EPA, right?

1 A I don't know when Mr. Sullivan turned over his data to
2 the EPA or if he ever did. I just don't know that for
3 certain.

4 Q All right. You didn't hear him say that he personally
5 did not turn over Exhibit 4811 -- put that back up, please --
6 to the EPA, the April 28, 2003 report completed prior to the
7 RI finalization?

8 A I don't recall any testimony about, from Mr. Sullivan
9 about that.

10 Q And as a professional who works with Superfund sites and
11 all these state and federal rules and regulations, wasn't
12 it -- wouldn't it have been incumbent upon the owner of
13 property being evaluated as part of the Superfund
14 investigation, as this was at this time, and the PRP letter
15 had come out and so forth, wasn't it incumbent upon Soco to
16 turn this information over to the EPA and MDEQ as a matter of
17 law, as you understand it?

18 A I make it a point not to give clients legal advice. As a
19 matter of law, I have no idea whether they were required to
20 turn this over or not. That's not my practice. I'm not an
21 attorney.

22 Q You don't know that -- are you a licensed engineer?

23 A I'm a professional engineer in Maryland and Florida.

24 Q So you have a license from Maryland and Florida.

25 A Yes.

1 Q And does that licensure require -- would that licensure
2 require you to turn this over to Maryland and Florida
3 authorities if you were working on a site in those states?

4 A No, it would not.

5 Q Are you sure about that?

6 A Yes, I am.

7 MR. GROSSBART: Now can you put 469, page 2, up
8 there?

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 BY MR. GROSSBART:

11 Q Do you have any idea how the perc that was found here,
12 how it got there; that is to say, underneath that catch basin
13 area?

14 A Well, not specifically, but if you'd indulge a little bit
15 of professional speculation, more likely than not, what
16 happened was there were drips and drabs and small spills in
17 the tank farm area which subsequently were washed with
18 stormwater or via a hose -- it could have been either -- and
19 accumulated in the ponds there behind the tank farm. And then
20 subsequently the water became contaminated with the perc, and
21 it seeped down through cracks in the concrete and ponds and
22 got into the soil underneath it. That would be the most
23 likely explanation.

24 Q Sure. And you heard Mr. Sullivan say there was no, when
25 they dug this up, there was no liner underneath the concrete?

1 Do you remember him saying that?

2 A I believe that was his testimony, yes.

3 Q All right. And the soil concentration there is
4 274 milligrams per kilogram? Do you recall him saying that?

5 A No, not specifically.

6 MR. GROSSBART: Would you put 4811 back up, please?
7 Would you flip through to the table, Neil? Just keep going
8 and I'll see it.

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 MR. GROSSBART: Next one, please. Can you highlight
11 the section?

12 DOCUMENT TECHNICIAN: (Complied with request.)

13 MR. GROSSBART: All right. Let's swing down. Stop
14 there, please.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. GROSSBART:

17 Q That's, that's the finding of 274 at that location, isn't
18 it, sir?

19 A (No response.)

20 Q Tetrachloroethylene? That's perc, right?

21 A Well, it certainly reports 274 parts per million. I
22 can't see the top of the page --

23 Q All right.

24 A -- at this point so I'm not sure --

25 Q We can fix it for you.

1 A -- what it's associated with.

2 MR. GROSSBART: All right. Highlight the top of the
3 page.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. GROSSBART:

6 Q Does that square that away for you?

7 A It reports that it's soil. I presume it's underneath
8 that concrete.

9 Q Yeah.

10 A You know, I can't tell that just from the information in
11 front of me, but I will presume for argument sake that it is.

12 Q You testified about this exhibit just a few minutes ago
13 on direct examination, and did you read it in preparation for
14 your testimony here in court?

15 A Yes. I saw it.

16 MR. GROSSBART: All right. You can take all this
17 off.

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. GROSSBART:

20 Q Now you testified a lot about MIP borings during your
21 direct examination. Do you recall that?

22 A Yes.

23 Q And if I recall correctly, you compared the MIP boring at
24 105, which is in the catch pond, with a boring called MP-100.
25 Let's see if I can find that.

1 This would be DD143, Soco's exhibit. You made those
2 comparisons and remarked that they look considerably
3 different. Do you recall that?

4 A Yes, I did.

5 Q And then you remarked about MP-100 by noting how close it
6 is to PT-2. That's what you say over here. Right?

7 A (No response.)

8 Q That's the point you're making?

9 A Well, I don't believe I commented on the closeness in the
10 specific area you circled. It's actually noted a little bit
11 higher up on the boring logs.

12 Q Okay.

13 A Six feet north of MP-100.

14 Q All right. I stand corrected.

15 The point is, you believe that's significant because
16 there are not any analytical results for MP-100, and by that I
17 mean actual laboratory results. It's just the ECD detector
18 results for that particular site, right?

19 A That's correct. It's just a -- it's a line on a strip
20 chart. It's not an actual concentration of chemicals in the
21 soil.

22 Q Because a lab sample was not taken at MP-100 by the EPA
23 or DEQ, correct?

24 A Not that I'm aware of, no.

25 Q All right. And a lab sample was taken, however, at

1 MP-105.

2 A My understanding is they went back in, drilled a hole
3 next to 105, and took a sample and looked at horizons they
4 selected, yes.

5 Q They reported a high groundwater contamination deep in
6 MP-105; the lab did, right?

7 A The lab reported a high con- -- a concentration of about
8 2,900 parts per billion at the bottom of the borehole, which
9 would be the bottom of the sand and gravel aquifer at 105.

10 Q That was not an ECD reading? That was a lab reading?

11 A That's right.

12 Q All right. And whatever significance MP-100 had to the
13 EPA and MDEQ investigators who were looking at that sample,
14 they didn't think it was significant enough to send to the lab
15 for further analysis? We can infer that, can't we, from the
16 fact that it wasn't done?

17 A No. I think you're confused about this sampling
18 technique. An MIP boring is not a technique by which you're
19 taking cores of soil or groundwater out of the ground. It's a
20 reading that's made with a probe that's driven continuously
21 into the ground. In order to get a soil or a groundwater
22 sample, you have to then go back in and drill a hole next to
23 it or nearby and take those samples. So there isn't any
24 inherent soil or groundwater sampling associated with MP-100.

25 Q I understand that, sir. But having seen the ECD readings

1 as reported on this document, the MDEQ and EPA investigators
2 did not think it significant to go back in there and take a
3 sample at any depth to have it checked in the lab, did they?

4 A I don't agree. I think they did go back and take
5 samples. They took PT-2, which was only 6 feet away.

6 Q Well, PT-2 was done -- do you know when PT-2 was done?

7 A I don't recall the specific date.

8 Q Wasn't that done by Mr. Sullivan when he was with Secor
9 back in late 2001, early 2002?

10 A It may have been. I don't recall the specific date. I
11 think it was one of the early tests in that area.

12 Q All right. When was the MP-100 ECD test run, do you
13 know?

14 A I don't recall the specific date. It was done during the
15 RI.

16 Q Well, it was done after the RI, wasn't it?

17 A I don't recall the specific date it was done.

18 Q It was done and reported in the addendum to the RI that
19 came out in December of 2003, correct?

20 A I believe that's correct, yes.

21 Q All right. And we just saw the RI, and that came out in
22 June of 2003, and then additional work, including the MP-100
23 ECD detector test, was done later, correct?

24 A As far as I'm aware, yes.

25 Q All right. So they didn't go in and look at PT-2 for the

1 first time after MP-100 was done. That came before.

2 A I believe that's correct.

3 Q Okay. So let's go back to my original question.

4 Having done the boring at MP-100 and seeing what you've
5 displayed in your demonstrative, the EPA and MDEQ did not go
6 in and try to test soil or groundwater at that bore location,
7 correct?

8 A As far as I'm aware, they didn't go back in and try to
9 replicate the information they already had. They already
10 had --

11 MR. GROSSBART: Your Honor?

12 THE COURT: Hold it.

13 MR. GROSSBART: Come on.

14 THE COURT: He asked a simple question. Answer yes
15 or no. He didn't ask for an explanation.

16 THE WITNESS: Okay.

17 BY MR. GROSSBART:

18 Q They didn't go back in there and take a sample at any
19 depth for the lab to look at, correct?

20 A Not that I'm aware of, no.

21 MR. GROSSBART: All right.

22 THE COURT: Now let's stop for lunch. We're going
23 to have a lunch recess until 1:15.

24 I give you the usual admonition.

25 We'll be in recess, 1:15 p.m.

1 THE LAW CLERK: All rise.

2 (Recess taken from 11:58:21 to 13:19:14.)

3 (Open court.)

4 (Jury present.)

5 THE COURT: Mr. Grossbart, you may continue.

6 MR. GROSSBART: Thank you, Your Honor.

7 BY MR. GROSSBART:

8 Q I want to start by just following up on something that we
9 only touched upon briefly before the break but you talked
10 about more significantly, I think, during your direct
11 examination.

12 Neil, could you please put up Exhibit 3059, page 121,
13 which is the ROD diagram, and blow up on where the source
14 areas are shown.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. GROSSBART:

17 Q And do I recall correctly, Dr. Powell, that as to that
18 particular representation, you have -- you don't accept the
19 EPA and MDEQ's characterization of that as a source area? Did
20 I understand you correctly?

21 A No, I don't think you did understand me correctly.

22 Q Okay. It is a source -- is it a source area, however,
23 that you can, based on the data, in any way tie to the spill
24 that you have hypothesized must have occurred?

25 A I think it may be. I'm not sure.

1 Q You're not sure.

2 And do you know why the EPA and MDEQ characterized --
3 excuse me, concluded that that was a DNAPL source area or at
4 least had indicators of DNAPL?

5 A I don't think they indicated it was a DNAPL source area.
6 They indicated it was a source area of PCE that was higher
7 than their remediation goal.

8 Q So is it your understanding, then, that the data in that
9 area doesn't -- did not meet any of the various indicators
10 that you had discussed during your direct examination?

11 A To the best of my recollection, it did not.

12 Q Did not.

13 And isn't it a fact, sir -- well, let me do it this way.

14 Neil, would you put up Demonstrative 494, page 1? And
15 enlarge on the northwest corner and towards the -- all right.
16 Show me the -- give me some more to the left, please. A
17 little more. A little more.

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. GROSSBART:

20 Q All right. Can you clearly see on the photograph in
21 front of you, which is a copy of the 1975 photograph, can you
22 see the area we've been talking about? It's just got dotted
23 green lines. Do you see that on your monitor?

24 A Yes.

25 Q All right. And do you know what was found at DP-063?

1 A I don't recall specifically.

2 Q Do you recall generally?

3 A No.

4 Q Do you even know what report that comes out of?

5 A I believe that may have been some of the very early work
6 done as part of the Lockheed assessment, but I'm not
7 absolutely certain.

8 Q All right. Wouldn't it be important to look at all of
9 the data to determine whether or not one or more of your three
10 indicators were met in doing the work you did?

11 A Yes. You should consider all of the data that's
12 available.

13 Q All right. And if DP-63 had groundwater contamination
14 north of 2,400 parts per billion, is that one you would have
15 missed, based on the pie charts we went through earlier today?
16 Because I didn't see it on there.

17 A If it had been above 2,400, it probably should have had a
18 pie chart put on it.

19 MR. GROSSBART: All right. Would you put up
20 Exhibit 3043, please?

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q That's the Lockheed report in evidence. I think you
24 talked about that in your direct.

25 A That's right.

1 MR. GROSSBART: All right. And would you go to
2 page 27? And, Neil, please, to the right-hand side, right
3 here, blow up that box.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 MR. GROSSBART: And that's DP -- hang on. Wrong
6 box. Go back to the big one. One below it.

7 DOCUMENT TECHNICIAN: (Complied with request.)

8 BY MR. GROSSBART:

9 Q And that, at least in this particular sample, is showing
10 north of 2,400 parts per billion, is it not?

11 A Yes, it is.

12 Q Okay. So in order to make the pie charts that you talked
13 about in your direct examination fully complete, we would need
14 to add a piece of pie for DP-63, correct?

15 A Yes.

16 Q Now we'll come back to the pie charts and talk about some
17 of those a little bit.

18 But we were talking about DD143 before we broke, and you
19 were remarking and we were talking about MP-100 and the fact
20 there were no analytical samples, which is to say no
21 laboratory samples for that area, that boring location,
22 correct?

23 A As far as I'm aware, yes.

24 Q Okay. And what you have thought relevant here is the
25 proximity of MP-100 to PT-2, where there are lab samples that

1 show the perc contamination that you, indeed, superimpose on
2 your MP-100 diagram right in here, correct?

3 A Correct.

4 Q And there actually are MP borings even closer, by a
5 little bit, but even closer to PT-2 than is MP-100, aren't
6 there?

7 A I don't specifically recall. I'd have to look at all of
8 the data on the map to be sure. I don't know.

9 Q You don't know. And if there are MP borings, one or more
10 MP test locations closer to PT-2 or as close to PT-2 as MP-100
11 that look radically different than the one you've picked, that
12 would be something you would need to consider and decide
13 whether it impacts the points you were making about MP-100
14 early this morning, correct?

15 A Well, you'd want to consider all of the borings that you
16 have in the area. That's right.

17 Q Well, did you consider MP-138?

18 A We considered all of the borings in that area.

19 Q All right. And you don't recall what MP-138 shows, do
20 you?

21 A Not off the top of my head, no.

22 Q Isn't it a fact that the MIP log for 138 shows no
23 off-scale readings at all?

24 A I don't recall.

25 Q The MIP data was set forth in the remedial investigation,

1 Addendum No. 1, correct?

2 A Yes.

3 Q And that's the one that came out -- refresh me, if you
4 could. That came out when?

5 A I believe it was 2003.

6 Q I'm sorry; when?

7 A 2003, but I don't recall the specific date.

8 MR. GROSSBART: All right. Let's pull up 3058, the
9 first page, please.

10 DOCUMENT TECHNICIAN: (Complied with request.)

11 BY MR. GROSSBART:

12 Q Is that the RI addendum that sets forth the various MIP
13 findings and results, do you know?

14 A I believe it is, but --

15 MR. GROSSBART: Okay. And would you go to page 154,
16 Neil?

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. GROSSBART:

19 Q And is that -- it's oriented a little differently than
20 yours, but that is a representation of the findings at
21 MIP-138, correct?

22 A It appears to be, yes.

23 Q And when you did your demonstrative exhibit -- let's go
24 back to DD143.

25 DOCUMENT TECHNICIAN: (Complied with request.)

1 BY MR. GROSSBART:

2 Q You were showing in orange on this demonstrative
3 exhibit -- Neil, could you blow up that area here?

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. GROSSBART:

6 Q You were showing on this demonstrative exhibit a reading,
7 if you will, that was greater than whatever that is, right?

8 A Right.

9 Q And because, as you go from left to right, and I don't
10 want to get bogged down in what all these things mean, but on
11 the right is more than it is on the left, so to speak? That's
12 the way the scale works, right?

13 A That's right. On the right side is a higher signal than
14 the left.

15 Q And when you talk about the meter pegging, you're talking
16 about the meter crossing this line? Is that what that means?

17 A Yes. EPA, I believe, used a million microvolts as sort
18 of their off-scale benchmark.

19 Q All right. So that's a shorthand for a million
20 microvolts?

21 A Yes.

22 MR. GROSSBART: And can we go back to the RI
23 addendum at page 154?

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 ///

1 BY MR. GROSSBART:

2 Q You have that in front of you, and I can blow up any part
3 you want to look at, because I can't make heads or tails of
4 this, but do you see any readings north of a million
5 microvolts depicted on that document?

6 A No, I don't.

7 MR. GROSSBART: Okay. Let's take that off.

8 DOCUMENT TECHNICIAN: (Complied with request.)

9 BY MR. GROSSBART:

10 Q And you don't know, as you sit there, where MP-138 is in
11 relationship to either MP-100 or PT-2, correct?

12 A Not as I sit here. I've seen it on maps, but not as I
13 sit here.

14 Q I understand. As you sit there.

15 And you would expect that if it was in very close
16 proximity to, example, for MP-100, there would be more
17 similarity between MP-100 and MP-138 that you just looked at,
18 correct?

19 A Not necessarily, no.

20 Q Well, if I told you they were only 2 feet apart, does
21 that not give you some pause about what may or may not be
22 going on in this particular area, given that you've pegged
23 from top to bottom on MP-100 and not pegged at all on MP-138?
24 Is that not significant to you as a scientist?

25 A If they were 2 feet apart and looked this different, it

1 would be surprising to me.

2 MR. GROSSBART: Okay. Why don't you turn, Neil, to
3 3058, page 86.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. GROSSBART:

6 Q And the field investigator has mapped, in his field notes
7 on this document, the locations of PT-100 -- excuse me, PT-2,
8 MP-100, and MP-138. Do you see that, sir?

9 Neil, why don't you blow up on that area.

10 DOCUMENT TECHNICIAN: (Complied with request.)

11 BY MR. GROSSBART:

12 Q Do you see that, sir?

13 A Yes, I do.

14 Q And you said, in your demonstrative, that DD143 -- and
15 why don't we just toggle back to that.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 BY MR. GROSSBART:

18 Q You said in your demonstrative that MP-100 is
19 approximately -- excuse me, that PT-2 is approximately 6 feet
20 north of MP-100. That's what you say there, right?

21 A Right.

22 Q And you, you computed that, and you believe that to be
23 accurate, right?

24 A As far as I'm aware, yes.

25 Q Okay. Well, that gives us a little frame of reference.

1 Could we go back to page 86? Blow that area up.

2 DOCUMENT TECHNICIAN: (Complied with request.)

3 BY MR. GROSSBART:

4 Q So you've told us that this distance from there to there,
5 PT-2 to MP-100, is 6 feet. Right?

6 A Right.

7 Q MP-138 is actually a smidgeon closer to PT-2 than is
8 MP-100, at least according to the field investigator who wrote
9 this out, isn't it?

10 A It's drawn as being closer, yes.

11 Q Yes. And if the distance between MP-100 and PT-2 is
12 6 feet, as you've studied, then just by looking at this and
13 eyeballing it, MP-100 and MP-138, 2 feet apart, according to
14 the field investigator?

15 A I wouldn't know. This isn't a detailed, scaled drawing,
16 but it appears to be closer.

17 Q All right. So based on your prior answer, studying
18 further MP-138 may be something worthwhile to do to try to get
19 to the bottom of what you characterize as something that would
20 be surprising to you, right?

21 A I'm not sure what you mean by the question.

22 Q You told me if MP-138 and MP-100, just a few questions
23 ago, were as close together as 2 feet and looked as different
24 as you've already said they do, that would be surprising to
25 you. Didn't you just say that a minute ago?

1 A Yes, I did.

2 Q Are you surprised?

3 A If they're that close together, it's surprising to me
4 that the logs look so different.

5 Q That's at least worthy of further attention and thought,
6 isn't it?

7 A (No response.)

8 Q I'm not asking you to give it up for me, sir, but isn't
9 it at least worthy of another look?

10 A I'm not sure. It depends on what, what you're using the
11 information for.

12 Q I'm using the information like you're using the
13 information. You don't -- is it irrelevant? If it is, I'll
14 just move on.

15 A I'm not sure how you're using the information, sir.

16 Q Well, I'm using the information in a courtroom to try to
17 figure out if a spill happened in the loading and unloading
18 area and zigged and zagged its way up to the northwest corner
19 and caused all this commotion. That's how I'm using it. Is
20 it relevant to that?

21 A Is this boring relevant to that?

22 Q Yeah.

23 A Yes, I think it is.

24 Q All right. And you're surprised, given the difference
25 between MP-100 and MP-138, right?

1 A It is a bit surprising to me that the logs look this
2 different when they're this close together.

3 Q All right. Are you aware of the fact, when they pulled
4 the MP rod out of the ground at MP-100, the one your
5 demonstrative deals with, the needle was still pegging? Is
6 that unusual?

7 A Not necessarily, no.

8 Q That does not indicate at least the possibility that
9 maybe there was a problem?

10 A No, not necessarily.

11 Q Did you try to determine, through the field notes
12 relating to MP-100, if that, in fact, was happening, whether
13 the rod used for MP-100 was decontaminated in a way that was
14 affecting the readings?

15 A No.

16 Q Did you notice the field investigator's note that
17 suggests some unusual behavior, if you will, of that
18 particular boring?

19 A No, I did not.

20 Q You did not notice his note?

21 A No.

22 MR. GROSSBART: Let's take that off, please, Neil.

23 DOCUMENT TECHNICIAN: (Complied with request.)

24 MR. GROSSBART: Would you put 3059-121 back up,
25 please? Would you please enlarge --

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 MR. GROSSBART: That's perfect. Thank you.

3 BY MR. GROSSBART:

4 Q Now I think on direct examination there was some
5 discussion about this figure and how it compared to a figure
6 that was trying to depict similar things but in the earlier
7 EPA/MDEQ report. Do you recall that?

8 A Yes.

9 Q And I can put it back up if you want me to, but this area
10 was -- and I'm just not trying to do it to scale, so -- but
11 there basically was a gap, if you will, in between the two
12 areas, right?

13 A You're referring to the depiction of this in the RI
14 addendum?

15 Q Yes, sir.

16 A Yes, there was a gap.

17 Q All right. And isn't it a fact that in the RI
18 addendum -- well, strike that.

19 In any event, by the time of the ROD, those areas had
20 been connected on this diagram? That really has to do with
21 where Soco is going to be required or somebody is going to be
22 required to fix things, correct?

23 A Correct.

24 Q And the ROD makes no statement about whether the
25 situation out here is one release, two releases, or a hundred

1 releases, doesn't it? It doesn't speak to that issue at all?

2 A I don't think the ROD cares how many releases are
3 created.

4 Q Whether it cares or not, it doesn't speak to the issue,
5 does it?

6 A No.

7 Q And in the RI addendum that you just referred to,
8 EPA/MDEQ suggested, based upon the uncertainty of the data,
9 that the area down here might be a separate source; isn't that
10 correct?

11 A I don't recall.

12 MR. GROSSBART: Would you pull up 3058, please?

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. GROSSBART:

15 Q Would you go to page -- this is the RI addendum, right?

16 A Yes, it is.

17 MR. GROSSBART: Would you go to page 27 of the
18 exhibit, please?

19 (Discussion off the record.)

20 MR. GROSSBART: Scroll down, please. Neil, would
21 you, first of all, highlight the title?

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 BY MR. GROSSBART:

24 Q And this part of the RI addendum is talking about the
25 northwest corner. Fair statement?

1 A Yes.

2 Q And the first paragraph talks about I guess what we could
3 all agree is the main area of the northwest corner? It refers
4 to PT-2 and 6, which, we know those to be as kind of the
5 center of that source area, if you will. Fair statement?

6 A Yes. It's in more or less the center of the northern of
7 these two areas, the bigger area.

8 Q Right. And then if you highlight, Neil, the first
9 sentence of the second paragraph, it says, "A smaller PCE NAPL
10 source area was identified in the vicinity of Monitoring Well
11 PT-1 and Boring 132," *et cetera*. Do you see that?

12 A Yes.

13 MR. GROSSBART: And go back, Neil, to the ROD
14 figure, 131 -- excuse me, 3059, page 29.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 MR. GROSSBART: No, 3059, page 121. Enlarge there.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. GROSSBART:

19 Q Isn't it a fact, sir, if you know, that PT-1 is, in fact,
20 down there?

21 A That's correct.

22 Q All right. And as a scientist, you can't rule out the
23 possibility, can you, that at a minimum, two surface releases
24 account for what we see on this ROD figure, or more, but at
25 least two? You cannot rule that out, can you?

1 A I don't think that would be a reasonable interpretation
2 of the data that exists for that area, no.

3 Q So is that your way of saying you can rule it out?

4 A I'm sorry; could you restate the question?

5 Q My question was, You cannot rule out the possibility,
6 based on the data, like we heard from the EPA and the MDEQ,
7 that this source area might be the way it is as a result of at
8 least two, possibly more, but let's just stick with two, two
9 different surface releases?

10 A I don't think that could be categorically ruled out.

11 Q Okay. As a matter of fact, you can't rule out the
12 possibility of two or more releases coming from the Dyce site
13 in traveling to the northwest corner, can you?

14 A No. There could have been more than one release.

15 Q Could have been two?

16 A Could have been two.

17 Q And didn't you also tell me previously at your
18 deposition, could even have been three?

19 A I believe I said there could have been as many as three
20 but I doubted that there were that many --

21 Q Right.

22 A -- that there were probably no more than one or two.

23 Q All right. Could have been two.

24 And then we would have, if there were two, to use your
25 more conservative number, we'd have two hypothesized spills

1 accounting for the northwest corner situation, according to
2 your theory, rather than one; two that nobody saw, two that
3 nobody smelled, two that nobody cleaned up, two that nobody
4 reported, *et cetera, et cetera, et cetera*, correct?

5 A There could have been two.

6 Q And there was plenty of time before the plant was
7 reconfigured in 1981 in which these one or more spills could
8 have occurred, right? Anytime up to 1981 as a matter of fact;
9 isn't that correct?

10 A Well, there was certainly a number of years when the
11 plant was configured this way and they operated. If that's
12 what you mean by "plenty of time," okay.

13 Q Yeah. That's what I mean. Six, seven years, right?

14 A Right.

15 Q So notwithstanding the inventory shortage issue that
16 referred to an inventory shortage, and you heard the
17 testimony, in 1975, '76, and '77 -- you recall hearing that in
18 this courtroom, correct?

19 A Yes, I did.

20 Q Sometime in that period -- there's nothing about either
21 the science in the northwest corner or the configuration of
22 the plant itself that, if we were to be true to your
23 hypothesized spill and pathway, there's nothing that rules out
24 1978, '79, or 1980, right?

25 A That's correct.

1 Q You need the inventory shortage to make this spill
2 happen, don't you?

3 A I'm not sure I understand the question. I would say no.

4 Q All right. Is the inventory -- are you relying on the
5 inventory shortage --

6 A No.

7 Q -- as support for your scientific opinion that we've
8 heard here today?

9 A Well, I gave a lot of opinions today. Which specific
10 opinion?

11 Q Any of them. Any of them.

12 A No, I'm not.

13 Q The inventory shortage is irrelevant to your opinion?

14 A No, I didn't say that.

15 Q Well, are you relying on the inventory -- let me try it
16 again, because I thought one followed the other, but let me
17 try it again.

18 You have offered an opinion. Are you offering an opinion
19 as to the timing of the spill that you hypothesized made it
20 from the loading and unloading area to the northwest corner?
21 Are you giving an opinion on that or not? I guess I'm not
22 clear.

23 A Yes, I am.

24 Q And is that opinion that the, that the spill happened in
25 1975, 1976, or 1977, or is it something else?

1 A It's something else.

2 Q It's anytime up to 1981, right?

3 A Yes. The spill would have had to have occurred sometime
4 before 1981.

5 Q And without the inventory shortage and whatever that may
6 mean and however any of us listening in might view it
7 ourselves, without that inventory shortage, based upon your
8 work, 1975 or '76 is as likely a time period or candidate for
9 this as 1979 or 1980, right?

10 A In the absence of the inventory shortage, that's correct.

11 Q Right. And you're not relying on the inventory shortage,
12 so you're not placing this in any point in time as an expert?
13 You're not offering that opinion?

14 MR. LYNCH: Objection. Asked and answered.

15 MR. GROSSBART: Well, I just want to be --

16 THE COURT: Sustained.

17 MR. GROSSBART: -- sure the answer's clear.

18 BY MR. GROSSBART:

19 Q Now you looked at photographs, and you are -- your
20 opinion is dependent, is it not, on there being a berm at the
21 southern edge of the tank farm?

22 A If you're referring to my opinion about runoff from the
23 unloading area going to the northwest corner, yes, it's
24 contingent on there being a berm.

25 Q And if there was no berm, you would have to reevaluate

1 your opinion; is that right?

2 A Yes.

3 Q If there were cuts in the berm, you would have to
4 reevaluate your opinion, correct?

5 A That would depend on how deep the cuts were.

6 Q All right. If there was only a partial berm, you would
7 have to reevaluate your opinion?

8 A That depends on where the partial berm was located.

9 Q Between the drumming shed and the railroad tracks.

10 A If there were a partial berm between the drumming shed
11 and the railroad tracks, it would not affect my opinion. It
12 would be supportive of my opinion.

13 Q Even if it was not a complete berm?

14 A Perhaps I don't understand what you mean by "partial"
15 berm.

16 MR. GROSSBART: Let's put up the 1975 photo.

17 (Discussion off the record at counsel table.)

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 MR. GROSSBART: This is 5017. Next.

20 MS. ENERSON: 5019.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 MR. GROSSBART: Could you blow up on the loading and
23 unloading area?

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 ///

1 BY MR. GROSSBART:

2 Q I believe it was your testimony that you believe that a
3 continuous berm runs through there, or thereabouts, at least,
4 correct?

5 A Correct.

6 Q And you can't, however, see a berm doing that, running
7 continuously in this photo at this point in time, can you?

8 A Not on this photo. The shadows obscure most of it.

9 Q Well, the shadows obscure that area, so they could be
10 obscuring a berm, or they could be obscuring nothing at all
11 because there's no berm there? You can't tell one way or
12 another?

13 A Not from this photo, no.

14 Q Okay. Well, this is the only photo from late '75.
15 Everything you see on a subsequent photo would only tell us
16 what was there on the date of the subsequent photo; isn't that
17 right? That's just logical, isn't it?

18 A I don't think I would completely agree with that, no.

19 Q All right. That's okay.

20 If there were two spills -- well, strike that.

21 Other than the existence of a southern berm -- well, let
22 me ask you this. You believe there's a southern berm based on
23 testimony you've heard; is that right?

24 A It's in part testimony I've heard and in part photography
25 I've reviewed.

1 Q Well, at least in 1975, it's based on testimony, isn't
2 it, because you can't see it here?

3 A That date, it would principally be testimony.

4 Q Is there anything else that suggests a berm other than
5 testimony, that you're aware of?

6 A Only that I can clearly see the berm on photographs in
7 the following years in the same place the testimony describes
8 it was present in '75.

9 Q I understand. But that doesn't put the berm in '75, the
10 fact that it might be there later, does it?

11 A It would corroborate the testimony.

12 Q All right. And listening to that testimony and forming
13 your opinion as to this essential element of your opinion, you
14 rejected, I take it, then, the sworn statement by Dyce as
15 executed by Suzanne Miller that in this period of time that
16 we're talking about, 1975, liquid in the loading and unloading
17 area would flow to the catch pond? Your opinion necessarily
18 requires you to reject that statement, does it not?

19 MR. LYNCH: Objection. Misstates the evidence.

20 THE COURT: Overruled.

21 THE WITNESS: I don't recall that specific testimony
22 or statement, whatever you're referring to.

23 BY MR. GROSSBART:

24 Q Well, whether you recall the statement or not, did you
25 read the Rule 104(e) responses that Soco/Dyce provided in 2000

1 to the EPA in doing your work in this case?

2 A Yes. I read it quite a long time ago.

3 Q All right.

4 A It's not something I reviewed recently.

5 Q All right. Isn't it a fact that those sworn 104(e)
6 responses say exactly what I just said; which is, that in
7 those responses, Soco told the United States government and
8 the Montana Department of Environmental Quality that had a
9 spill happened in this area in the period prior to the
10 reconfiguration of the plant, liquid would make its way to the
11 catch pond because the slope of the property was generally in
12 that direction?

13 A I don't, I don't recall whether it said that or not with
14 regard to that specific time period. I just don't recall.

15 Q All right. Now let's come back to that in a minute, but
16 I'm going to ask you a few questions about some of the pie
17 charts that you showed earlier.

18 Could you put up DD104?

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 BY MR. GROSSBART:

21 Q This particular pie chart is labeled "Chemicals" --

22 MR. LYNCH: Objection. We actually didn't show this
23 pie chart.

24 MR. GROSSBART: I may have it under a different
25 number. You didn't show this one at all?

1 MR. LYNCH: (Shook head negatively.)

2 MR. GROSSBART: Well, let's take it down.

3 DOCUMENT TECHNICIAN: (Complied with request.)

4 MR. GROSSBART: Can I just -- for Mr. Lynch's
5 benefit, I apologize, but I have many charts with the same
6 numbers.

7 Can you look at DD102? Did you use that one?

8 MR. LYNCH: I frankly don't recall if I used that
9 one.

10 THE COURT: The objection is overruled. I mean, if
11 it's part of the report, you can use it.

12 MR. GROSSBART: All right.

13 (Discussion off the record at counsel table.)

14 MR. LYNCH: Your Honor, this is just an illustrative
15 exhibit or a proposed illustrative exhibit that was never used
16 or offered.

17 THE COURT: Oh.

18 MR. GROSSBART: To be fair, Mr. Lynch and I have an
19 agreement. We've exchanged large volumes of demonstrative
20 exhibits with one another, and the deal was, unless the other
21 side uses it, I won't, but --

22 THE COURT: I thought it was part of the report. I
23 don't have the report. I reverse myself. Sustained.

24 MR. GROSSBART: I'll stipulate to that, Your Honor.

25 MR. LYNCH: I believe it was 103 and 105.

1 MR. GROSSBART: Irrespective of the number, was it
2 the exhibit that had --

3 THE CLERK: It was 103 and 105, is what I have.

4 (Discussion off the record at counsel table.)

5 THE COURT: The clerk's records show 103 and 105.

6 THE CLERK: I have DD103 and DD105 is what you
7 showed.

8 (Discussion off the record at counsel table.)

9 MR. GROSSBART: All right. Would you go to DD105?
10 I can make the point with this.

11 DOCUMENT TECHNICIAN: (Complied with request.)

12 BY MR. GROSSBART:

13 Q And this demonstrative that you did talk about on direct
14 is called "Chemicals in Groundwater Samples in Concentrations
15 Greater than 2,400," and that's the symbol for parts per
16 billion? It's not really the symbol for parts per billion,
17 but that's what everybody calls it, right?

18 A Yeah, micrograms per liter means parts per billion. Same
19 thing.

20 Q Right. Synonymous.

21 And in doing that, was it your intention to capture every
22 groundwater sample that exceeded that amount?

23 A No, not necessarily. It was intended to be illustrative
24 of the approximate levels of VOCs that are being found in
25 these locations that's reflected by the size of the circles

1 and the general mix of VOCs that are being found at each
2 location. I don't know that it necessarily is each and every
3 sample, but it was just meant to be illustrative of the
4 general patterns of groundwater contamination.

5 Q Well, okay. So if there -- so there may be groundwater
6 samples otherwise on the Dyce site broadly defined that exceed
7 this number that you haven't included; is that correct?

8 A There could be, yes.

9 Q Okay. So you made -- basically you looked and you just
10 picked out kind of the best ones to make the point?

11 A Not the best ones, no. I meant to pick out ones that
12 were illustrative, and it was my intention that we would pick
13 out all of them that exceeded this 2,400. If we missed any,
14 then, you know, they're not shown.

15 Q Was there any other criteria that you used in deciding
16 what to depict and what not to depict?

17 A No. That was the main criteria, areas where perc was
18 above the 1 percent solubility limit.

19 Q All right. Did you put any date restriction on the dates
20 of the samples in terms of what might disqualify a sample from
21 making your pie chart?

22 A The only restriction we put on the groundwater data was
23 once they began their remediation process in the northwest
24 corner, which, I believe, the first pilot testing was in 2003,
25 if I'm not mistaken, we didn't use any data after that because

1 the data was biased by their remediation project that they
2 were doing.

3 Q The process of sparging and vapor extracting and so forth
4 calls into question the validity of the data taken after those
5 projects began? That's just sort of a general principle that
6 you scientists adhere to; is that correct?

7 A No, I don't think it calls it into question as much as
8 it's a different period with different data. It doesn't
9 reflect sort of a preremediation condition of the site.

10 Q And it's your view that looking at things as sort of
11 preremediation is a better way of analyzing the situation
12 because things are not disturbed by the remediation process?
13 Do I have that right, or am I close?

14 A For the purposes of what I'm trying to convey here, I
15 felt it was appropriate to use the preremediation data.

16 Q All right. And this preremediation data, when you draw
17 your cutoff, is that the very first, at the time of the very
18 first pilot that you're cutting that off?

19 A Yes, to the extent we're talking about the area in the
20 northwest corner. They haven't done remediation everywhere.

21 Q No, I'm talking about -- I understand that the
22 operational area of the plant is different. There is not
23 ongoing remediation of the sort that you talked about in your
24 direct like there is going on in the northwest corner,
25 correct?

1 A That's correct.

2 Q And so isn't it a fact that the first pilot test, which
3 was an air sparge/soil vapor extraction, started sometime in
4 2002?

5 A It may have been. I remembered 2003. It could have been
6 2002, though.

7 Q Wasn't that followed by an ozone sparge/soil vapor
8 extraction project that came next?

9 A Yes, it was.

10 Q And then that was followed by a soil vapor extraction
11 project which came -- only, which came even later; is that
12 right?

13 A Yes, in 2004.

14 Q And your data all predates the first of those pilots, or
15 it was intended to; is that correct?

16 A Yes.

17 Q Whenever it was?

18 A Yes, in that part of the property.

19 Q Now this ozone, this sparging process and soil vapor
20 extraction process, is that the process where ATC or those
21 hired by, went out into the northwest corner and dug 11-foot
22 trenches there, and I suppose other places, but at least
23 there, and to set up their remediation equipment?

24 A No, that's not.

25 Q Isn't it a fact that 11-foot trenches were dug all over

1 the northwest corner by 2003 for an ozone sparge system, soil
2 vapor extraction?

3 A To my recollection, the trenches were dug after the
4 initial pilot tests, the air and the ozone pilot tests.

5 Q Well, the ozone test was an ozone and soil vapor
6 extraction combined process, wasn't it?

7 A Yes.

8 Q So that required trenches, didn't it?

9 A No.

10 Q Are you sure?

11 A No, it did not.

12 Q Are you absolutely sure about that?

13 A Yes. As I recall the ATC reports, they initially put in
14 vertical extraction wells for vapor recovery, and, finding
15 those didn't work too well in these soils, they subsequently
16 put in trenches at a later period.

17 MR. GROSSBART: Bear with me.

18 (Pause.)

19 MR. GROSSBART: Would you pull up 4400? Go to
20 page 30.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q Do you have that in front of you?

24 A Yes, I do.

25 MR. GROSSBART: And go to the next page.

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 BY MR. GROSSBART:

3 Q And you talked on direct examination about all sorts of
4 poundage of chlorinated compounds being removed as a result of
5 various remediation activities to date. Do you recall that
6 generally?

7 A Yes, I do.

8 MR. GROSSBART: Would you flip to page 34? And
9 highlight the paragraph that begins, "The horizontal trench
10 vapor extraction."

11 DOCUMENT TECHNICIAN: (Complied with request.)

12 BY MR. GROSSBART:

13 Q While you're reading that, this report reports on a
14 soil-vapor-extraction-only system, not any ozone sparging,
15 right?

16 A That's right.

17 Q All right. Isn't it a fact that the trenches used for
18 that remediation date back to the ozone sparging that was done
19 in the year earlier as reflected here; isn't that what this
20 says? Quote, the second sentence, "The trench system was
21 originally constructed and designed as part of an *in situ*,
22 ozone-sparging initiative."

23 A That's what it says, yes.

24 Q All right. So I was right, wasn't I?

25 A I'm not sure I understand the question.

1 Q The trenches, the trenches go back to at least 2003?

2 A I don't recall the specific date. This refers to 2004.
3 I don't have the date in front of me when the trenches were
4 installed.

5 Q But you would agree that whenever the ozone sparging was
6 done, that's when the trenches had to have been built,
7 correct?

8 A I think that's correct.

9 Q Okay.

10 (Discussion off the record at counsel table.)

11 BY MR. GROSSBART:

12 Q All right. Going back to the demonstrative that we had
13 up, and we're calling that DD one zero -- what is that? --
14 five, all right, where is that?

15 A I don't understand the question.

16 Q What's the name of that well?

17 A I don't know. That information is not on here. I don't
18 recall the specific name.

19 Q But you picked it, right?

20 A Yes.

21 Q Are you aware that it was represented to me in materials
22 that were provided to me so I wouldn't object to this exhibit
23 that that is, in fact, a well location called T-5?

24 A I am not aware of what's been represented to you, no.

25 Q All right. Do you deny that that is T-5?

1 A I can neither confirm nor deny. I don't know for
2 certain.

3 Q Have you heard of a well site called T-5? Or T anything,
4 for that matter?

5 A Not that I recall, no.

6 Q Doesn't that stand for samples taken from the trenches
7 that we've just been talking about?

8 A That would be a reasonable inference.

9 Q All right. How about that one? If I represented to you
10 that that was a T sample, in that case, Trench 9, you would
11 have no basis to dispute me, then, would you?

12 A I -- no. I don't know.

13 Q T-4?

14 A I don't know.

15 Q Any basis of dispute?

16 A No.

17 Q T-6 south? Any basis to dispute?

18 A I'm sorry; I didn't see where you made a mark.

19 Q (Indicating.)

20 A No.

21 Q And if those are samples taken from these trenches, then
22 the criteria you just talked about, which is to say take
23 samples before remediation, were, in effect, violated by this
24 selection of sampling locations, correct?

25 A I don't know. I would have to look at the actual

1 concentrations there and how they compared to what was going
2 on in the aquifer around it. If they showed a materially
3 different level of contamination from what historically was
4 placed there, then I would not have intended to use them. On
5 the basis of what I have in front of me, I would say I don't
6 know.

7 MR. GROSSBART: Okay. All right. Let's -- would
8 you pull up 3074, page 26?

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 MR. GROSSBART: I'm sorry; 3674.

11 DOCUMENT TECHNICIAN: (Complied with request.)

12 MR. GROSSBART: Page 26.

13 BY MR. GROSSBART:

14 Q You have been to the site, have you not, sir?

15 A Yes, I have.

16 Q And I think one of the things you told us on direct is
17 some aspects of the site, as it currently exists, helped you
18 picture the pathway that you have hypothesized for how this
19 perc left the loading and unloading area; is that right?

20 A That's right.

21 Q Okay. Do you know what we're looking at here?

22 A We are looking at a view of the site from the west side
23 of the railroad tracks, I believe, to the east along the north
24 wall of the small warehouse.

25 Q Okay. I would agree with that. And if your spill

1 pathway theory is correct, hundreds of gallons of perc came
2 through that area, right?

3 A That's correct.

4 Q All right. And, now it's not there on this picture, but
5 then hit a ditch and turned this way, and that ditch -- I
6 would accept that this building wasn't there at the time, but
7 somewhere in this, either under the sidewalk or perhaps in a
8 little farther under that building there was a ditch, and that
9 allowed, according to your opinion, the perc to get to the
10 northwest corner?

11 A That's correct.

12 Q All right. And at the time in question, which is the
13 late '70s, '75 to '81, this area was what composition?
14 Asphalt? Concrete? Gravel? Dirt? What was it?

15 A To my understanding, it was unpaved. I believe it may
16 have been gravel-covered, but it definitely was not paved.

17 Q All right. So the perc then, again accepting your theory
18 for the time being, would have come across what at the time
19 was a gravel area in there?

20 A Yes.

21 Q All right. And it's your opinion that going underneath
22 that concrete and looking is futile? Looking for perc. Is
23 that right?

24 A I don't believe, if you tested there today, it's likely
25 you're going to find high levels of perc, if that's what you

1 mean by "futile."

2 Q Well, if you found high levels of perc there, that would
3 tend to support your theory, wouldn't it?

4 A It might.

5 Q Why not look, then?

6 A Because for the same reasons I explained related to the
7 sampling of the ditch. I don't believe it's likely you're
8 going to find much there in the soils, and this is an area
9 that's obviously been reconstructed since that early period.

10 Q Well, digging trenches didn't stop you from using data
11 that we just saw. Why, why worry about all of the
12 reconstruction here? Why not just jack up some concrete and
13 take a look? What would it cost?

14 A I'm afraid I don't understand the analogy.

15 Q What would it cost to jackhammer up the concrete in a
16 couple of places and look, just to see, for the fun of it, if
17 there's any perc under there?

18 A It would likely cost \$5,000 or \$10,000 to go in and do a
19 drilling program in that area and do the testing.

20 Q I'm not asking for a drilling program. How about drop
21 two of them there? How much would that cost?

22 A Probably \$5,000.

23 MR. GROSSBART: Okay. And would you put up Picture
24 28, same exhibit, page 28?

25 DOCUMENT TECHNICIAN: (Complied with request.)

1 BY MR. GROSSBART:

2 Q And the old ditch is coming -- I can do a better job than
3 that. The old ditch is coming somewhere in there or in there.
4 You could sample that anywhere along the line to look for
5 perc, if you wanted, right?

6 A You could sample along the ditch.

7 Q Did you have any discussions with anybody about the
8 wisdom, or not, of running samples like those?

9 A It's an issue that Mr. Lynch and I spoke about at some
10 point during my work on the case.

11 Q Well, we have an agreement not to get into your
12 conversations with the Soco lawyers, and I will respect that,
13 but I'm talking about with anybody else besides Soco's
14 lawyers. For example, internally. Did you have discussions
15 like that internally?

16 A It's something that Dr. Hawley and I spoke about.

17 Q And decided it wasn't worth the time and effort?

18 A Yes.

19 Q And is the only reason it would be not worth the time and
20 effort, in your opinion, because whatever perc was deposited
21 there on its way to the northwest corner evaporated a long
22 time ago?

23 A Yes. I think it's unlikely we would find things there if
24 we looked today, and we can't be certain, where we look, it's
25 really the soil that was at the bottom of the ditch because of

1 all of the construction that's gone on since then.

2 Q Well, the only thing that happened since then is that
3 area, at least farther down the tracks, has been raised up,
4 right? It hasn't been dug up? It's been raised up so they
5 could make the tracks go farther to the northwest; isn't that
6 true?

7 A It's been regraded and filled, and then there's been
8 considerable construction, new construction on top of it.

9 Q Well, not all the way to the northwest corner.

10 A Not all the way to the northwest corner.

11 Q Well, what about in the area on the way to the northwest
12 corner where there hasn't been construction? What about
13 testing there?

14 A Well, there's been, in the area where there hasn't been
15 construction, there's already been considerable testing. I
16 didn't feel we needed to do more. There's already been quite
17 a bit already.

18 Q What well point or well points do you believe have a
19 condition in them revealed by the testing that supports your
20 theory that one spill came down that ditch and went to the
21 northwest corner?

22 A Borehole F has conditions in it that are consistent with
23 a spill coming down that ditch.

24 Q Any others?

25 A Not until you get into the northwest corner itself.

1 Q And Borehole F doesn't have -- Borehole F has
2 biodegradation byproducts and so forth, unlike the center of
3 the northwest corner? You talked about that at length, right?
4 It doesn't look like the northwest corner, does it?

5 A It does in that it has high levels of perc, but it also
6 has degradation products of perc as well.

7 Q Borehole F, you made a point on direct this morning
8 saying that plant area looks like something completely
9 different than the northwest corner area when you looked at
10 things like BTEX and biodegradation products. Do you remember
11 that? That was a point you made this morning.

12 A Yes, that's correct.

13 Q And Borehole F looks a lot more like the plant than it
14 does like the northwest corner, doesn't it?

15 A I would say it's somewhere in between the two.

16 Q All right.

17 THE COURT: Let's stop. It's cookie time.

18 MR. GROSSBART: Can I have one, Your Honor?

19 THE COURT: No.

20 (Recess taken from 14:18:58 to 14:33:48.)

21 (Open court.)

22 (Jury not present.)

23 THE COURT: First off, again, when you're looking
24 for an exhibit, talk with Amanda. She knows which exhibits
25 have been admitted and what they are.

1 Now I just learned this morning -- this is how
2 competent I am with the modern miracles of technology. I just
3 learned this morning that you tweet on Twitter. So having
4 said that, we've got all these notebooks and all these
5 exhibits that have been admitted. Is there a chance that each
6 of you will be able to make a disk of the exhibits that have
7 been admitted on your side, on Soco's side, and then maybe you
8 could each submit a -- and I don't know this.

9 We don't have extra laptops, do we?

10 THE CLERK: We might. I can talk with Michael.

11 THE COURT: We'll have to talk with our IT people.

12 THE LAW CLERK: We have one, I know for sure.

13 THE COURT: That's clean?

14 (Laughter.)

15 THE COURT: You know, here I'm using the miracles of
16 modern technology. I don't mean that bad in any way, "clean,"
17 but, I mean, nothing on it. I don't even know if it's
18 possible to have a computer with nothing on it. I suppose.

19 And then what we'd end up doing during jury
20 deliberations is I know there's a big-screen TV on a cart
21 around here. We'd haul it in there, hook it up. If they each
22 had a laptop, one for the Soco's exhibits and one for the
23 insurers, we could probably -- I know that on the realtime
24 summary you've been getting every night there's been -- it's
25 set out in there what exhibits have come in during the day.

1 Right, JoAnn?

2 THE REPORTER: Um-hmm.

3 THE COURT: What's involved in putting together a
4 contents?

5 THE REPORTER: I have that. I just haven't provided
6 it to anybody.

7 THE COURT: Oh, really.

8 THE REPORTER: Yeah. I've given it to Amanda.
9 Yeah, I have that.

10 THE COURT: With the exhibits?

11 THE REPORTER: Um-hmm, um-hmm.

12 THE COURT: You just push a button?

13 THE REPORTER: Um-hmm.

14 MR. COZZENS: Yeah, we can do that easily, Judge.

15 THE COURT: I'll be darned. So that's what I want
16 you guys to think about over the weekend, because it will be
17 silly putting all these books in there, now that we have all
18 these fancy gadgets. And I include TV with that.

19 MR. COZZENS: They have to keep the books for me.

20 THE COURT: Pardon?

21 MR. COZZENS: I said, they have to keep the books
22 for me.

23 THE COURT: And me. Right.

24 All right. Let's get the jury.

25 THE LAW CLERK: All rise.

1 (Jury present.)

2 THE COURT: Please be seated.

3 How were they?

4 (Jurors responded affirmatively.)

5 THE COURT: I even snuck one. My prerogative.

6 Go ahead, Counsel.

7 MR. GROSSBART: Thank you. Thank you, Your Honor.

8 BY MR. GROSSBART:

9 Q Dr. Powell, let me just ask you a few miscellaneous
10 questions to close up a couple subject areas and I'll move on
11 to another one.

12 I think you said, in the last session we just had, that
13 you understood this ozone sparging system or pilot project to
14 involve vertical trenches or vertical something or other.
15 What did you say?

16 A I said the earlier pilot tests that were run initially
17 involved vertical wells to use for the soil vapor extraction
18 component, and when they found that those didn't work too well
19 in these silty clay soils, they then later installed trenches
20 for the further testing they did.

21 Q Sure. Do you dispute the fact that the trenches were in
22 place by no later than January of 2003?

23 A I don't recall the specific dates so I wouldn't dispute
24 that.

25 Q All right. Let me see if I can refresh your

1 recollection, then, with Exhibit 3191. It's actually already
2 in evidence. Maybe we'll just put it up. 3191.

3 Go to the second page, Neil. Let's go back to the first
4 page.

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. GROSSBART:

7 Q This is a report by ATC dated November 13, 2003. Do you
8 see that?

9 A Yes.

10 MR. GROSSBART: Okay. Now we can go to the second
11 page. First paragraph, blow that up.

12 DOCUMENT TECHNICIAN: (Complied with request.)

13 BY MR. GROSSBART:

14 Q That's talking about this ozone sparging system, right?

15 A Yes, it is.

16 Q And by that time, you've tried to weed out data from your
17 pie charts that comes after that point in time, right?

18 A Well, it was the intention to weed out data that would be
19 affected by pilot testing, yes.

20 Q All right. And this refers to trenches, does it not?

21 A Yes, it does.

22 MR. GROSSBART: Okay. In the second paragraph, just
23 highlight the first sentence.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 BY MR. GROSSBART:

1 Q That puts the time frame on it; early 2003, right?

2 A Yes, it appears to.

3 Q All right. So in point of fact, when I asked you about
4 horizontal trenches and all that, I didn't have it wrong, did
5 I?

6 A Pardon me?

7 Q I'll withdraw the question.

8 One followup on these MIP wells. The EPA/MDEQ's MIP
9 results, we talked about how they came out in the RI addendum
10 at the end of 2003. Do you recall that --

11 A Yes.

12 Q -- just generally?

13 And do you recall that -- well, let me ask you a few
14 questions about these MIP things.

15 Aren't they really considered more of a field screening
16 device rather than an analytical test? Is that a true
17 statement?

18 A Yes, they're a screening tool. They don't provide
19 specific information on concentrations in groundwater or soil.

20 Q And it's very tricky correlating an ECD response to a
21 total concentration; would you agree with that?

22 A Yes. Yes, it is.

23 Q Okay. And would you also agree that off-scale ECD
24 readings are not, by themselves, an indicator of the presence
25 of a NAPL source?

1 A Yes, I would agree with that.

2 Q By themselves, they're not enough, right?

3 A That's right.

4 Q You need a confirmatory lab sample to make that leap, do
5 you not?

6 A Yes, you would want to go in and do testing.

7 Q Right. And as a matter of fact, when the RI addendum
8 came out and was using this MIP data to delineate source areas
9 on the Dyce plant, ENVIRON, along with ATC, pushed back on the
10 EPA/MDEQ and told them, in effect, that at least in the
11 opinion of ATC and ENVIRON, the EPA and MDEQ was wrong in
12 their reliance on these MIP samples; is that not correct?

13 A I don't specifically recall, but I wouldn't agree -- I
14 wouldn't disagree with the position that it would be wrong to
15 rely on those alone in making these judgments.

16 Q Well, and as a result, ATC and ENVIRON wrote reports to
17 the EPA, questioning the degree to which the EPA was relying
18 on those MIP results; isn't that correct?

19 A I believe that is correct, yes.

20 Q Now in talking about the catch pond -- and would you put
21 up DD143, please?

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 BY MR. GROSSBART:

24 Q In talking about the catch pond, that brings into play
25 MP-105, which is an ECD reading in the catch pond, right,

1 among other things? It's at least that, right?

2 A That's right.

3 Q And that particular location also had a confirmatory lab
4 sample on top of the ECD, and perc was found in the
5 groundwater; isn't that correct?

6 A That's correct.

7 Q All right. And you remarked during direct how, if the
8 catch pond was a source, you would have expected to see
9 concentrations higher up, closer to the surface; isn't that
10 correct?

11 A Concentrations in the groundwater, yes, and in the soil.

12 Q Either?

13 A Either.

14 Q Okay. And now the EPA was out there doing all of this
15 sampling in 2002, 2003, 2004, in through that period; I guess
16 2002 and 2003, right?

17 A Right.

18 Q And you know, sir, that by no later than 1981, that whole
19 catch pond area was dug out and made bigger?

20 A The original catch pond from '75 was enlarged in '81,
21 yes.

22 Q And it was enlarged by digging out and removing large
23 quantities of dirt and earth, among other things; isn't that
24 correct?

25 A I am not sure. I don't know how much dirt they actually

1 had to move to build it.

2 Q All right. Did you not -- well, let's just put up this.

3 Would you put up 5033, please, Neil? Enlarge on the
4 catch pond area.

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. GROSSBART:

7 Q You look at aerial photos all the time as part of your
8 job, right?

9 A Right.

10 Q Isn't, in fact, what's shown here plainly a pile of earth
11 or dirt?

12 A It's an area of disturbed soil. It appears to be an area
13 of disturbed soil to me. I wouldn't characterize this as a
14 pile based on looked on this alone, and I'd have to look at it
15 in stereo to know if there was any elevation to it.

16 Q All right. So you can't rule that out as you sit here,
17 correct?

18 A I have no basis to agree or disagree.

19 Q All right. And you didn't look at that in stereo?

20 A I don't think I've seen this set of dated photos in
21 stereo that I recall.

22 Q Okay.

23 A I may have, but I just don't recall.

24 Q And just so the jury understands, experts like yourself,
25 there's a process where you can put these photographs on a

1 machine that kind of makes them show up in 3D, in effect, to
2 keep it simple; isn't that a fair statement?

3 A Yes. You look at two photographs side by side, look at
4 them through a special instrument, and you can see 3D in the
5 photos.

6 Q And if that was a dirt pile, presumably, of any
7 consequence, you'd see the 3D effects of the dirt pile?

8 A If you had stereo coverage, yes.

9 Q Right.

10 A You should be able to see it.

11 Q Right. And you didn't do that?

12 A No.

13 Q Okay. Now if the catch pond was dug up to some
14 significant depth as part of the project that's led to the
15 reconfiguration of the plant, then whatever contaminants were
16 in the dug-up soil, assuming they were there, would be removed
17 right with the dirt; isn't that right?

18 A Some of the contaminants would have likely been removed.
19 Whether they were all removed would depend on how much they
20 excavated --

21 Q Sure.

22 A -- or how deep the contaminants had penetrated into the
23 soil.

24 Q And isn't it a fact that even later, this was
25 reconfigured again, and several feet of fly ash were put into

1 the hole?

2 A Yes. The boring data shows this area was subsequently
3 filled with fly ash.

4 Q You heard testimony, I believe, from Mr. Naff about an
5 acid spill off a railcar. Do you recall that earlier this
6 week?

7 A I recall testimony about the spill. I don't recall which
8 witness talked about it.

9 Q Fair enough. But a witness talked about an acid spill.
10 And you also recall from that testimony that the witness said
11 it was more likely than not that that acid spill happened
12 after the plant had reconfigured by no later than the date of
13 this picture, 1981; isn't that correct?

14 A I don't remember that testimony, but I understand that
15 the big spill that was being talked about occurred later after
16 the reconfiguration occurred, but I don't remember specific
17 testimony about that.

18 Q Well, okay. But you have a general recollection from
19 your work that this big acid spill at the end of the railroad
20 tracks happened after the reconfiguration was done?

21 A That's my understanding, yes.

22 Q Okay. Fair enough.

23 And that acid, because thankfully the plant had been
24 reconfigured, to the extent it flowed anywhere, would have
25 flowed to the catch pond; isn't that right?

1 A I'm not sure. I think it depends on which side of the
2 tank car the spill occurred. If it occurred on the left side,
3 the west side, it would have arguably gone down outside the
4 berm. If it occurred on the east side, the tank farm side, it
5 would have likely gone down the berm and into the catch pond.
6 I just don't remember any specific information on which side
7 of the car it occurred on.

8 Q What if the tank just went off the end of the tracks?
9 It'd be within the tank, right?

10 A I don't understand.

11 Q I'll withdraw the question.

12 The point of moving the berm from east of the tracks to
13 west of the tracks and spending all that money to fix things
14 up that way was to catch spills emanating from railcars? That
15 was the point of doing it, right?

16 A In part, I think that's true. I think there were other
17 areas they were trying to capture as well.

18 Q Well, I understand that. But among other things, they
19 were trying to ensure that anything happening on the tracks
20 would be caught by the catch pond?

21 A I think that was part of their motivation, yes.

22 Q Okay. So if things worked like they were supposed to
23 when this acid spill happened, acid running off away from the
24 site would go into the catch pond? Isn't that just logical?

25 A It's only logical to me if the spill occurred on the east

1 side of that tank, that tank car that's sitting there.

2 Q You don't -- you have, you have no information as to the
3 details of how this spill happened?

4 A I don't recall any information or testimony earlier this
5 week as to which side of the tank car it actually occurred on.

6 Q All right. Now you also talked earlier about a company
7 called Kaivos doing some testing in and around the catch pond.
8 Do you recall that?

9 A Yes.

10 Q And that was done in the mid '80s, 1985, '86,
11 thereabouts. Do you recall that?

12 A Yes.

13 Q And obviously at that time the plant's been reconfigured?
14 We can all agree on that, right?

15 A Yes.

16 Q Okay. And Kaivos, you know from looking at their
17 reports, looked at soil samples, quote, in the pasture area on
18 the west and north sides of the fenced plant. Okay? Do you
19 remember that, from all your study and work?

20 A Vaguely, yes.

21 Q All right. And you would agree that this is fenced?

22 A It is.

23 Q Okay. And this is fence?

24 A It is.

25 Q And Kaivos looked out here? Thereabouts? The exact

1 location isn't important, but that's what they're talking
2 about, the pasture area along the west and north sides of the
3 fenced plant? That's how you take that to mean, correct?

4 A I understand they looked certainly north of the fence.
5 I'm not sure whether they looked west of the fence as you've
6 shown, because that's not Dyce Chemical's property. That's
7 someone else's property, and I don't know whether they went
8 over there and tested or not. I just don't recall.

9 Q What, you think this isn't Dyce property?

10 A I believe the other side of that fence was a trucking
11 company property.

12 MR. GROSSBART: Slide the picture to the right,
13 Neil.

14 DOCUMENT TECHNICIAN: (Complied with request.)

15 BY MR. GROSSBART:

16 Q Isn't this the Dyce property line?

17 A Okay. You're right. With the larger photo.

18 Q All right.

19 A You're correct.

20 MR. GROSSBART: Go back the other way, please.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q I don't need to belabor it, it's not really important,
24 but somewhere in that arc, Kaivos did testing, and that's what
25 they mean by outside -- or, excuse me, around the west and

1 north sides of the fenced plant? That's how you read the
2 report, too, isn't it?

3 A Yes.

4 MR. GROSSBART: Okay. Would you pull up
5 Exhibit 856A, page 75? And the very last sentence, beginning,
6 "Also." Just the last sentence.

7 DOCUMENT TECHNICIAN: (Complied with request.)

8 BY MR. GROSSBART:

9 Q Okay. And according to Kaivos, acid residue from the
10 catch pond has significantly affected soil pH. Do you see
11 that sentence?

12 A Yes.

13 MR. GROSSBART: Okay. Let's go back to the photo.
14 Take that down and go back to the '81 photo.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. GROSSBART:

17 Q So if they're testing for acid out here and saying acid
18 residue from the catch pond is affecting pH, doesn't that mean
19 something is coming out of the catch pond?

20 A I didn't read it that way, but I didn't write the report,
21 so --

22 Q You can't comment on that one way or another?

23 A I can't comment. I didn't understand that's what they
24 meant when I read it, but I didn't write the report.

25 Q Okay. Now let's talk about some of the aerial photos in

1 the devegetated areas that are apparent on some of them.

2 It's your -- I think you testified this morning during
3 direct examination that at least in some significant part that
4 devegetation seen over the years on these photos is due to the
5 periodic release, I guess, or runoff of 2,4-D, a chemical
6 manufactured by the company that occupied the site prior to
7 Dyce?

8 A That's correct.

9 Q All right. Now Dyce bought this property and moved out
10 there -- well, they bought the property in 1972. You know
11 that, do you not?

12 A Yes. Approximately '72.

13 Q Um-hmm. And they moved there in '73 and started
14 operations. You know that, right?

15 A Yes, I believe that's correct.

16 Q You also know from your work that Dyce never manufactured
17 or sold 2,4-D in the entire, the entire time it operated,
18 right?

19 A Not to my knowledge, they didn't, no.

20 Q So they didn't handle 2,4-D?

21 A Not that I'm aware of, no.

22 Q All right. So whatever 2,4-D is out there is left over
23 from the prior owner, or, I should say, the operations of the
24 prior owner?

25 A That's my understanding.

1 Q And it's your testimony that the progression of
2 denudement that's apparent in the aerial photos is all due to
3 2,4-D that was left over from the early '70s?

4 A No, that was not my testimony.

5 Q Okay. Well, is any of the denudement seen in '79, '81,
6 '83, can any of that be explained by 2,4-D from ten years
7 earlier?

8 A Some of it, I think, can be, yes.

9 Q Some of it can be.

10 A Yeah.

11 (Discussion off the record at counsel table.)

12 BY MR. GROSSBART:

13 Q We'll do a few of these, and then I'll turn the floor
14 over to Mr. Davis.

15 All right. Let's go to 5017, please. And, Neil, I'll
16 take this off, but let's -- give me, if you can, thereabouts.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. GROSSBART:

19 Q Okay. Now fair to say, sir, is it not, that in the
20 northwest corner area, you'd agree with me is out there,
21 right?

22 A Yes.

23 Q There really is not significant devegetation out there
24 that's visible on this photo in 1974, is there?

25 A Doesn't appear to be, no.

1 Q All right. And you'd agree with me it's a little spotty
2 in through there?

3 A It's spotty in there.

4 Q Maybe a little worse down low?

5 A That's right.

6 Q All right. Do you attribute any of the devegetation that
7 we see on this photo to 2,4-D?

8 A Yes.

9 Q And would that be down here, among other places?

10 A Among other places, yes.

11 Q How about up here?

12 A Yes. It's quite likely from 2,4-D.

13 MR. GROSSBART: Okay. Let's go to 1975,
14 Exhibit 5019.

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. GROSSBART:

17 Q Now do you attribute any -- well, let's bring it out a
18 little, Neil.

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 MR. GROSSBART: Okay. Hold it right there.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q Again, pretty good out there, right, all things
24 considered?

25 A It doesn't appear to be heavily devegetated, if that's

1 what you mean by "pretty good."

2 Q Yeah, that's what I mean.

3 A Okay.

4 Q So no 2,4-D out there causing any problem?

5 A Not at this time.

6 Q Now 2,4-D, that operation has been shut down now for at
7 least three years, maybe more, but that, you think that 2,4-D
8 is going to come back to life sometime in the future as we go
9 through these things? Is that what we're going to hear?

10 A Based on the testimony I heard from Mr. Naff yesterday, I
11 believe that there are episodic periods when there's releases
12 of 2,4-D in which it has an impact and then that impact
13 subsides and then it can reoccur.

14 Q Okay. Well, whatever causes the 2,4-D to emerge from the
15 depths, it's not happening in '74 or '75, is it, and affecting
16 this area?

17 A Not affecting that area, no.

18 Q Okay. What about is that 2,4-D or is that something
19 else?

20 A It quite likely could be 2,4-D.

21 Q All right. Could it have anything to do with the barrel
22 washing operation we heard from Mr. Slater who testified by
23 video as having taken place down there? He was there in the
24 summer of '76. Could it be due to that?

25 A I don't think so.

1 Q So whatever Mr. Slater was doing by steaming or washing
2 barrels here, right here, that has nothing to do with --
3 that's all 2,4-D?

4 A I think more likely than not, it's an impact from 2,4-D,
5 yes.

6 Q All right. By the way, Mr. Slater talked about seeing a
7 spill about 12-foot by 12-foot, or thereabouts, standing on
8 the -- he used that word, "standing" on the loading and
9 unloading area. Somewhere in here, I gather. Do you recall
10 that testimony?

11 A I recall his testimony about seeing a spill, yes.

12 Q All right. And do you recall that he worked there in the
13 summer of 1976? Do you recall him saying that?

14 A I don't recall the specific time that he worked. I know
15 he said he was there in the summer because he said it was hot
16 at the time.

17 (Discussion off the record at counsel table.)

18 BY MR. GROSSBART:

19 Q You do not mean to suggest, I take it, that what Slater
20 saw, in his testimony, has anything to do with the spill that
21 you've hypothesized occurred and went to the northwest corner;
22 isn't that correct?

23 A I don't know whether they're related or not. I just
24 don't know.

25 Q Well, how -- a spill of water that was 12 feet in

1 diameter could be how many gallons? You can actually do those
2 computations, can't you?

3 A If I knew the depth of the water, I could.

4 Q Well, standing on an asphalt, a piece of asphalt
5 pavement, I don't think it would be very deep.

6 A It's possible to do those calculations, yes.

7 Q It would be about -- wouldn't be more than 20 gallons,
8 would it?

9 A I don't know. I haven't done those calculations.

10 Q Can't you -- wouldn't be more than 50 gallons? Do you
11 need to do a calculation even to tell us that?

12 A I'd have to think about it and do some calculations, yes.

13 MR. GROSSBART: All right. Well, I'm going to --
14 Your Honor, the parties have stipulated in this case as part
15 of the final pretrial order that Desmond Slater's employment
16 was the summer-fall of 1976.

17 Did I read that correctly?

18 MR. BANKER: Yes.

19 BY MR. GROSSBART:

20 Q How long would it take you to do those kind of
21 calculations?

22 A A couple of minutes.

23 Q You would at least agree with me, wouldn't you, that if
24 the spill that you base your entire opinion on has some
25 connection to an inventory shortage which you've heard

1 testimony happened in either the fourth quarter of the year or
2 the first quarter of the year, that a spill witnessed by
3 Desmond Slater in July or August of the calendar year, in his
4 case, 1976, had to be something else? That's just logical,
5 isn't it?

6 A Yes, it is.

7 Q Okay. All right. Let's go back to denudement,
8 devegetation.

9 Is "denudement," is that a word you use in your business?

10 A No, it really isn't.

11 Q Oh, okay. We'll call it devegetation.

12 A I understand what you mean.

13 MR. GROSSBART: All right. Now let's go to
14 Exhibit 5024, please. And, Neil, if you could, bring it out a
15 little.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 BY MR. GROSSBART:

18 Q Now this is 1977, and do you know what that thing is?

19 A That is an old pit that I understand was used during the
20 Dow era.

21 Q Okay. And it's empty now, right?

22 A It appears to be dry in this photo, yes.

23 Q And you would agree that things are devegetated there,
24 right?

25 A They seem to be, yes.

1 Q And is it your professional opinion that that is caused
2 by 2,4-D?

3 A I think more likely than not, that's why it's denuded,
4 yes.

5 Q And again, this barrel washing and steaming operation
6 that went on down there actually -- would you agree with me
7 that looks actually wet right there at that point?

8 A It is certainly dark. It could be wet.

9 Q Okay. And you ruled that out, that operation out, as a
10 contributor to the devegetation that we see here; is that your
11 professional opinion?

12 A Yes.

13 Q Okay. Well, whatever was causing that devegetation, for
14 the most part, you would agree with me, stops by that point,
15 right?

16 A At this time, yes.

17 Q Right. But you would also agree with me, would you not,
18 that there is devegetated area starting to show up there?
19 Right there?

20 A There appears to be, yes.

21 Q Okay. But in between the two, there is no apparent
22 devegetation, right?

23 A I don't see any on this photo, no.

24 Q All right. So I'll take a chance with this one. You
25 would agree with me that whatever is running in this direction

1 and causing that area of devegetation is separate and distinct
2 from what's happening there?

3 A At this point in time, yes, I think that's true.

4 Q Okay. Good. Okay.

5 Let's go to 5028, please. This is May of '79.

6 DOCUMENT TECHNICIAN: (Complied with request.)

7 MR. GROSSBART: Neil, bring it -- okay. Stop right
8 there. Zoom. Push it away a little. Okay.

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 MR. GROSSBART: Perfect.

11 BY MR. GROSSBART:

12 Q Would you agree we still see what appears to be a dark,
13 perhaps wet area where Desmond Slater testified he was
14 steaming barrels, although by 1979 he's obviously not doing
15 it, but presumably somebody else is? Do you see that?

16 A I see the dark area, yes.

17 Q Right. And is this a little outbreak of 2,4-D? Is that
18 what accounts for that devegetation?

19 A I think it is, yes.

20 Q Nothing to do with the barrels, steaming, and all of the
21 chemicals, the residue, *et cetera*?

22 A No.

23 Q Okay. In any event, it pretty much stops there. Is that
24 a fair characterization?

25 A I don't know that I'd agree with that.

1 Q Oh. All right. You're a little concerned about that
2 stuff?

3 A Yes.

4 Q Okay. Well, it certainly seems to peter out a little.
5 Would you agree that far?

6 A It's less pronounced the further northwest you go.

7 Q All right. But then we see -- and I don't mean to
8 suggest what I've drawn is devegetated, but I don't want to
9 cover up the devegetated area with my drawing. I want to
10 focus on the area, and I have, it's fair to say, circled a
11 devegetated area newly apparent in this particular photo.
12 Fair statement?

13 A Yes.

14 Q And is this all caused by 2,4-D?

15 A No, I don't think it is.

16 Q Do you have an opinion as to what caused it?

17 A I testified that it could have been caused either by
18 2,4-D at various times, or by the runoff of acidic stormwater
19 from along the tracks, or at some point in time by the release
20 of perc into that area which would kill vegetation. It could
21 be any of those. But less likely 2,4-D and more likely the
22 other factors by this time.

23 Q Well, if the inventory shortage is to be believed, the
24 perc spill happened in '75, '76, or '77, right?

25 A (No response.)

1 Q Your perc spill, or at least one of them?

2 A It's not mine, fortunately.

3 Q Well, you know what I mean.

4 A Yes.

5 Q Okay. So -- and perc is -- you even have a client who
6 uses perc as a weed killer. Got in trouble for doing so.

7 Didn't you mention that in direct?

8 A I don't think I said they got in trouble. They ended up
9 with a contaminated piece of property.

10 Q All right. They ended up with a contaminated piece of
11 property such that they had to hire you.

12 A That's right.

13 Q All right. And using perc as a weed killer, it's not
14 this delayed action thing? It kills the weeds once you apply
15 it? Doesn't take years to kill the weeds?

16 A It kills the weeds when you first apply it, and it
17 continues to kill the weeds as it sits there as a residue in
18 the soil.

19 Q Sure. But by the end of the period -- let's go to
20 September 1977, 5024.

21 DOCUMENT TECHNICIAN: (Complied with request.)

22 BY MR. GROSSBART:

23 Q We're now through at least the first quarter of 1977, the
24 end of that inventory -- frankly, the end of the period
25 altogether, because it was only Mr. Hallsten who referred to a

1 first quarter inventory shortage. Mr. Naff referred to a
2 fourth quarter one. Do you recall that?

3 A Yes, I recall that testimony.

4 Q Well, there's no indication out here of perc having
5 spilled sometime in '75, '76, or up to and including the date
6 of this photo, September 1977, getting out here, pooling, and
7 devegetating the area. It's just not there, is it?

8 A There's evidence of devegetation within the general area
9 you're circling, certainly.

10 MR. GROSSBART: Well, let's toggle back to the 1979
11 photo, which is 5028. Bring it in a little, please, Neil.

12 DOCUMENT TECHNICIAN: (Complied with request.)

13 BY MR. GROSSBART:

14 Q I mean, you'd have to agree there's a major difference
15 between '77 and '79 in the devegetation, wouldn't you? It's
16 startling.

17 A The '79 photo shows a greater area as being devegetated,
18 yes.

19 Q As a matter of fact, if I was to -- all right. Strike
20 that.

21 Let's go to 5033. Bring it in, please, Neil.

22 DOCUMENT TECHNICIAN: (Complied with request.)

23 MR. GROSSBART: Let's see.

24 BY MR. GROSSBART:

25 Q Overall worse, right?

1 A I'm not sure. Worse as compared to when?

2 Q The last photo.

3 A No, actually I think it's a little bit better. The '79
4 photo, which I believe is the last one you showed me --

5 Q Yes, it is.

6 A -- the apparently devegetated area is a little bit
7 larger. It's a little smaller here.

8 Q Maybe a little bit more skinny on the edge, but you
9 actually think that that's an improvement over '79? I mean,
10 that's okay, but that's your opinion?

11 A I think it is as compared to what I remember seeing on
12 the photo.

13 Q All right. Any chance that any of this is related to
14 2,4-D?

15 A Probably not at that time, no.

16 Q Right. I mean, what you actually see here is very little
17 by way of devegetation compared to the prior photos we've been
18 looking at, right?

19 A You're referring to the 2,4-D area?

20 Q Yes, sir.

21 A Yeah. You still see some minor devegetation, but it
22 doesn't extend all the way down to this northwest corner area.

23 Q Well, it never extended all the way down to -- strike
24 that.

25 What you have referred to as the 2,4-D-impacted area

1 looks much less distinct on this photo than it has on several
2 of the prior ones, right?

3 A That's correct.

4 Q And I don't think we saw any photo where you had 2,4-D
5 impacts all the way to the northwest corner, at least not yet.

6 A I think there was one that you showed me. 1975, perhaps?
7 There's been a lot of photos here, but there was one that you
8 showed me that extends all the way down to that area.

9 Q All the way to the northwest corner?

10 A No, down to the area where the fenced corner makes the
11 sharp angle.

12 Q I know, but here is --

13 A Down in that area.

14 Q That's the biggest area of denudement, out there.

15 Alls I'm trying to get you to agree with me on is what I
16 thought was the obvious, that this is not, this isn't 2,4-D.
17 It just simply can't be.

18 A I don't think, at the time of this photo, that it's
19 principally from 2,4-D, no.

20 Q And the barrel washing operation appears to be at least
21 inactive down there, doesn't it?

22 A Yes. It appears to have ended.

23 Q And you don't think that has any relationship to what
24 you've characterized as the 2,4-D area improving?

25 A No, I don't.

1 MR. GROSSBART: Okay. Go to 5036, please. Bring it
2 in, if you would. Bring it down.

3 DOCUMENT TECHNICIAN: (Complied with request.)

4 BY MR. GROSSBART:

5 Q Would you at least agree with me that there's no
6 improvement between the '81 photo and the '83 photo in terms
7 of the area of devegetation out in the northwest corner?

8 A The differences between those two time periods seem to be
9 fairly small.

10 Q Right. So if a '75, '76, or '77 perc spill or release
11 happened here and somehow -- and I know this is past the time
12 frame -- made it out, made its way out there and that is the
13 source of the devegetation, why wouldn't it have been much
14 better, improved, by 1979, in 1981, in 1983? It's staying the
15 same or getting worse.

16 A Well, over time, I think as the perc has migrated down
17 deeper into the soil and the concentrations near the surface
18 have become less and less, any impact it was going to have on
19 vegetation would have diminished.

20 Q But it doesn't get better out here? From '79 to '81 to
21 '83, it doesn't get better, correct?

22 A I don't agree. I think it did get better as compared to
23 '79. '81 and '83 don't seem to show a big difference.

24 Q Okay. Do you mean to offer as an opinion here to a
25 reasonable degree of certainty that the devegetation on any

1 one of these photos that we've seen, you can, again, to a
2 reasonable degree of scientific certainty, attribute to the
3 perc spill that you have hypothesized as the basis for why the
4 northwest corner is the way it is?

5 A No.

6 MR. GROSSBART: Okay. Then with that, I will -- I
7 have no further questions, and I thank you for your time. I
8 know it's been a long day for everybody.

9 THE WITNESS: Thank you.

10 MR. DAVIS: May I briefly, Judge?

11 THE COURT: Yep.

12 CROSS-EXAMINATION

13 BY MR. DAVIS:

14 Q Dr. Powell, I have good news for you. No more wells.

15 A That's good news.

16 Q Okay. But we will talk about the spill scenario.
17 Mr. Lynch asked you this morning that you think the most
18 likely explanation is a spill of approximately 500 gallons in
19 the loading or unloading area at Dyce in the mid '70s to
20 account for what you've analyzed in the northwest corner; is
21 that correct?

22 A I don't recall in my original opinion I put a date on it,
23 but a spill of that size, yes.

24 Q Yes. Okay. Because some of it's going to, a lot of it,
25 or I think roughly 35, 40 percent, isn't going to make it from

1 the loading area to the northwest corner for one reason or
2 another, evaporation or infiltration along the pathway,
3 correct?

4 A For a spill of that size, that's correct.

5 Q Yeah. So you need to have, the mass you've calculated in
6 the northwest corner of several hundred gallons, you need
7 roughly 500 gallons, taking into account variables for
8 atmospheric conditions, in the original spill? Something in
9 that range?

10 A That's right.

11 Q All right. And you'd agree with me, sir, that there are
12 three scenarios for a spill, possible scenarios, and I think
13 we'll be able to eliminate two of them very quickly, for a
14 spill in the operations area of Dyce: No. 1, perc coming in;
15 No. 2, perc sitting there; or, No. 3, perc going out. Those
16 would be the three different scenarios, wouldn't they?

17 A I'm not sure I understand what you mean by "coming in,"
18 "sitting there," or "going out."

19 Q All right. Well, perc was delivered to the Dyce
20 facility, was it not, in bulk?

21 A Yes, it was.

22 Q That's your understanding, isn't it?

23 A Yes.

24 Q Perc was stored at the Dyce facility?

25 A Yes.

1 Q And then perc was sold to customers and taken off of the
2 facility, off the premises?

3 A That's right.

4 Q Those are the three scenarios I'm talking about.

5 A Okay.

6 Q All right? And you'd agree that perc was stored in the
7 mid '70s at Dyce Chemical in Lockwood in either a 1,500-gallon
8 horizontal tank or in 55-gallon drums.

9 A That's the testimony I've heard, yes.

10 Q Yes. And I think the drums were stored in the warehouse,
11 were they not?

12 A That's the testimony I've heard, yes.

13 Q All right. And so obviously, if -- and in 55-gallon
14 drums, you would need nine or ten drums to spontaneously
15 catastrophically fail in the warehouse and then get outside
16 and then follow the path where you posited. We can eliminate
17 that, can't we?

18 A Yes. I don't think that's likely.

19 Q All right. And by the same token, we can eliminate a
20 catastrophic failure of the 1,500-gallon tank because it was
21 in containment?

22 A Yes.

23 Q It would have gone into the catch pond?

24 A That's right.

25 Q So we know that Scenario 2 didn't happen, don't we?

1 A (No response.)

2 Q That there was a failure during a static condition at
3 Dyce?

4 A I'm a little confused.

5 Q I know. It's late.

6 A I don't know what you mean by "Scenario 2."

7 Q Coming in, staying there, going out. Scenario 2 is just
8 staying there, that it's stored in the 55-gallon drums and the
9 1,500-gallon horizontal tank.

10 A Yes, I think it's unlikely the spill occurred by the mere
11 storage of product in tanks or drums.

12 Q I'm just trying to go through this logically with you,
13 sir.

14 A Okay.

15 Q And then the third scenario was perc going out, being
16 sold to customers, correct?

17 A Correct.

18 Q We're going to come back to No. 1.

19 A Okay.

20 Q I haven't forgotten about it.

21 And perc going out, you understood, perc went out in a
22 smaller skid tank to drycleaners or in drums.

23 A I have heard testimony that it went out either in a tank
24 or in drums.

25 Q All right. And the tank was 150 gallons?

1 A I don't recall the specific volume.

2 Q Well, it was certainly smaller than 500-gallons as a
3 delivery container, wasn't it?

4 A I just don't recall that.

5 Q All right. But obviously, again, if there's some problem
6 with drums, to get to 500 gallons and you're delivering perc
7 in drums, you'd need to, like Humpty-Dumpty, break open or
8 have nine or 10 barrels somehow fail at the same time?

9 A That's right.

10 Q Doesn't seem likely, does it?

11 A That's right. When I said it was a bulk-size release, I
12 meant to imply it is not a release from drums.

13 Q All right. And if perc -- if the skid tank that
14 delivered perc in bulk to drycleaners was 150 gallons, it's
15 pretty hard to have that tank fail and create a 500-gallon
16 spill?

17 A If it's 150 gallons and the release was from a failure of
18 the tank, it would not, obviously, create a 500-gallon spill.

19 Q All right. So I think we're back to Scenario 1, perc
20 coming into the facility, aren't we?

21 A I'm not sure that's the case.

22 Q You got another scenario?

23 A Well, I don't think I could rule out that in the process
24 of filling the tote tank to take perc to customers, that
25 someone became distracted, didn't keep an eye on the filling

1 process, the tank overfills, and there's a large spill and, by
2 the time they get back, there's perc on the ground. I don't
3 know whether that could have occurred or not, but I can't rule
4 it out.

5 Q All right. So you'd agree, and we've heard testimony --
6 you heard it in this courtroom -- that it was pumped by Dyce's
7 pumps at about 60 gallons a minute?

8 A I have heard that, yes.

9 Q Yeah. So if it took 60 gallons a minute, it would take a
10 little over two and a half minutes, or take about two and a
11 half minutes to fill a 150-gallon skid tank, wouldn't it?

12 A That's right.

13 Q And so if someone, instead of standing by the perc, the
14 skid tank for two and a half minutes, they'd have to wander
15 off for how long at 60 gallons a minute to cause a 500-gallon
16 spill?

17 A It would be about eight or nine minutes.

18 Q And then the first scenario that I think you discussed,
19 and I presume you were alluding to when Mr. Lynch was asking
20 you questions, was when perc came in on a tanker and was
21 offloaded, and I think you said you really didn't know; if
22 there was a failure between the tanker and the pump, if that
23 hose somehow came undone, you had no way to predict at what
24 rate the perc would come out of the tanker?

25 A That's right. I don't know what that flow rate would be.

1 Q But that's the scenario you had in mind when you were
2 answering Mr. Lynch's questions, wasn't it? They were
3 offloading a tanker, making a delivery of perc?

4 A I'm not sure which question you're referring to. I think
5 I said that the flow rate depended on which side of the pump
6 it occurred on. If it was on the tank farm side of the pump,
7 it probably would have been 60 gallons a minute. If it was on
8 the other side, I don't know what the rate would have been.

9 Q But what you're talking about there is a delivery being
10 made to Dyce in that scenario that you were envisioning for
11 Mr. Lynch, wasn't it?

12 A That's what I had in mind, yes.

13 Q Yeah. That's all I'm trying to see.

14 And you heard Mr. Hallsten testify in this courtroom, did
15 you not, that they normally ordered about 3,000 gallons of
16 perc a quarter?

17 A I heard 3,000. I heard 4,000.

18 Q All right.

19 A I'm not sure what was finally settled as the right
20 number.

21 Q All right. Either one will do for my purposes.

22 And you'd agree with me logically, in the offloading
23 scenario, if you have a 1,500-gallon tank and you're getting
24 3,000 or 4,000 gallons of perc, only a portion of that load is
25 going to go in the tank, correct?

1 A That's right.

2 Q The rest had to be drummed off?

3 A That's right.

4 Q Okay. And at 55 gallons, there would be a lot of drums
5 to fill, wouldn't there, after, after the 1,500-gallon tank
6 was filled?

7 A If it was a 3,000-gallon load, it would be about 30
8 drums.

9 Q Common sense tells you, doesn't it -- we didn't really
10 hear any direct testimony on that -- the logical way to do
11 that would be to fill the 1,500-gallon tank first, make sure
12 it was filled, and then turn to fill the drums?

13 A I don't know. I've never thought about it, but they
14 might have done it that way.

15 Q Yeah.

16 A I don't recall anyone testifying about that topic.

17 Q I understand. I'm just asking you. You've done forensic
18 examinations of other contaminated sites. I'm just trying to
19 get you to see if that makes sense to you, when you put on
20 your forensic hat.

21 A I don't think I've ever considered that question in
22 another site.

23 Q All right. You'd agree though, sir, I mean, if there
24 were a failure, the situation of there being a failure filling
25 the 1,500-gallon tank -- well, let me back up.

1 You heard Mr. Hallsten testify that's where the inventory
2 shortage was discovered, right, was the 1,500-gallon tank?

3 A Yes, I heard that.

4 Q Yeah. He had someone go out and check it three times.
5 There wasn't the right volume in that tank, was there,
6 according to him? That was his recollection?

7 A That's what I understand, yes.

8 Q Okay. And that's what the jury heard. That's what they
9 have to base their decision on, the evidence they hear here,
10 correct, and the documents they see --

11 A Yes.

12 Q -- including your testimony?

13 A That sounds like instructions from His Honor.

14 Q No.

15 A I assume that's the case.

16 THE COURT: Yeah. You're getting carried away now.

17 MR. DAVIS: Okay.

18 BY MR. DAVIS:

19 Q If, in fact, there were a failure filling that
20 1,500-gallon tank, does it make any sense to you that someone
21 would then go proceed to fill a dozen 55-gallon drums with
22 this huge puddle or spill of perc right there in the loading
23 area and nobody heard about it or knew about it?

24 A It doesn't, it doesn't seem logical to me that, having
25 just witnessed a large spill, someone would then proceed to go

1 ahead and fill a bunch of drums. That doesn't seem logical to
2 me, if that's what you're asking.

3 Q It seems downright silly, doesn't it?

4 A It doesn't seem logical to me that someone would do that.

5 Q All right. And let's try the other scenario, that they
6 filled the drums first before they filled the tank. You
7 understood how they filled drums, don't you?

8 A Yes, in general.

9 Q They filled them by weight, didn't they?

10 A Yes, that's the testimony I heard.

11 Q So you filled each 55-gallon drum, and I think Mr. Bender
12 said they had four on a skid and they would fill them
13 sequentially. Do you remember hearing that in his videotaped
14 testimony?

15 A I heard they filled them one at a time, and then there
16 were four placed on pallets --

17 Q Okay.

18 A -- once they were filled.

19 Q But you'd have to weigh each one, wouldn't you?

20 A Yes, you'd weigh them one at a time.

21 Q In the drumming shed.

22 A Yes.

23 Q All right. And so at 60 gallons a minute, how long would
24 it take to fill a 55-gallon drum?

25 A Just under a minute.

1 Q Okay. And so does that sound at all credible to you that
2 someone filling a 55-gallon drum, which takes a minute or so
3 to fill, somehow would cause a spill of 500 gallons in that
4 process in the drumming shed?

5 A No, that doesn't seem likely.

6 Q Okay. And if it were in the drumming shed, it would
7 probably, as you understand it, would have run through back to
8 the catch pond?

9 A That's not entirely clear to me. I thought, the
10 testimony that I've heard this week about where fluids within
11 the drumming shed would flow and some of the exhibits I've
12 seen, it's unclear whether it would have gone back inside in
13 containment or come out into the unloading area.

14 Q All right. In either situation, if someone left the pump
15 going while they're filling a 55-gallon drum to allow the
16 equivalent of ten or so drums be lost in that process to
17 create this 500-gallon spill, you'd agree that drumming shed
18 would be a mess, wouldn't it?

19 A If it happened there, there would be a lot of perc on the
20 floor.

21 Q Yeah. And you've certainly heard no testimony about
22 that, have you?

23 A No.

24 Q And, in fact, you'd also agree the vicinity of the
25 drumming shed was asphalt during all periods of time that we

1 need to be concerned about here?

2 A As far as I'm aware, the unloading area immediately in
3 front of the shed was asphalt.

4 Q Okay. And you would agree that perc serves as a solvent
5 for asphalt?

6 A Yes. It will dissolve the bitumen, the heavy tar-like
7 material that is in asphalt.

8 Q And you don't disagree with what Dyce or I guess Soco or
9 I guess it was HCI told the EPA back in 2000, that they
10 would -- that everyone connected with the facility would have
11 expected to see some evidence of that happening if there had
12 been a spill there?

13 A I don't recall that specific communication to EPA, so I
14 don't think I can agree or disagree.

15 MR. DAVIS: Neil, can you pull up Exhibit 383,
16 please?

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. DAVIS:

19 Q This is something Ms. Miller was examined about, and I
20 think Mr. Warne, too, yesterday when you were here. This is
21 the second request for information to the Section 104(e) or
22 second responses -- I'm sorry. The responses to the second
23 request of information pursuant to Section 104(e) of CERCLA.

24 You're familiar from your other work that some of the
25 people you work for have to fill out these 104(e) responses?

1 A Yes, I'm familiar with what these are.

2 MR. DAVIS: Okay. Could you turn to page 6, Neil?
3 And down at the bottom, the bottom paragraph.

4 DOCUMENT TECHNICIAN: (Complied with request.)

5 BY MR. DAVIS:

6 Q You'd agree -- or you don't disagree with what Dyce or
7 Soco told the EPA in this response, do you?

8 A I certainly agree with some of it. I'm not sure I would
9 agree with all of it.

10 Q So you take issue with what Dyce told the EPA?

11 A I don't know that I would completely agree with all of
12 it.

13 MR. DAVIS: Could we see, Neil, Exhibit 5038? Can
14 you blow that up, at least the loading/unloading area?

15 DOCUMENT TECHNICIAN: (Complied with request.)

16 BY MR. DAVIS:

17 Q And you were here yesterday when I asked Mr. Warne about
18 this picture?

19 A Yes.

20 Q Okay.

21 A I've seen this picture.

22 Q And you remember that he said that the semitractor that's
23 parked by the drumming shed represented the typical unloading
24 or loading configuration?

25 A Yes, I recall that testimony.

1 Q Okay. And that's the only testimony that you recall
2 hearing in this courtroom, isn't it true, about where semis
3 would come into the Dyce facility to unload by the drumming
4 shed?

5 A Well, Mr. Naff testified about where trucks came into the
6 facility, but on that specific question about if they were
7 going to unload to the drumming shed, would that be where they
8 parked? I believe that was the only instance anyone testified
9 about that topic.

10 Q Okay. And again, it's your testimony that if there's a
11 spill in this loading and unloading area back in the mid '70s,
12 that the natural course would be for liquids to flow westward
13 on the north side of the small barn or the small warehouse and
14 then down along the railroad ditch? I realize this picture
15 shows a reconfiguration where it wouldn't have happened.

16 A That's right.

17 Q All right. But that would be the natural flow pattern as
18 far as you were concerned?

19 A That's right.

20 Q All right. Can we see -- and you base that opinion not
21 simply on looking at the aerial photographs but your
22 on-the-ground examination when you went out there in the much
23 more recent past?

24 A In part, yes.

25 MR. DAVIS: Okay. Neil, may we see Exhibit 5033,

1 please?

2 DOCUMENT TECHNICIAN: (Complied with request.)

3 BY MR. DAVIS:

4 Q I think we've talked about the fact that there's a
5 concrete pad extending west -- or eastward from the small
6 warehouse down in the loading area. Correct?

7 A Yes, I've --

8 Q And you can see it here, can't you?

9 A I see an area of lighter pavement, if that's what you're
10 referring to.

11 Q And do you think that's the concrete pad?

12 A A portion of it probably is, yes.

13 Q Yeah. And it runs -- it's higher on the west end than it
14 is on the east end, isn't it? It slopes downward to the east?

15 A Yes, it slopes to where it comes out of the door of the
16 warehouse so it's a little bit higher than it is out further
17 on the pavement so that runoff runs away from the door.

18 Q It runs eastward, doesn't it?

19 A In that immediate area, yes.

20 Q Okay. And in this picture, can you see a wet area?

21 A I do, what appears to be a wet area, an area where the
22 pavement is dark.

23 Q All right. Yeah. In front of the drumming shed.

24 A Yes.

25 Q And do you see any evidence of that trying to flow in the

1 path you've depicted that this 500-gallon perc spill would
2 have taken that would have flowed westward? Do you see any
3 evidence of a westward flow in that wet area?

4 A No.

5 Q In fact, any westward flow is impeded by that light area
6 that may be the concrete slope, isn't it?

7 A I don't think I can agree with that based on what I see
8 in this photo.

9 Q All right. But you don't see any evidence of it flowing
10 westward, do you, from out in front of the drumming shed?

11 A No, no.

12 MR. DAVIS: Can we look at 5036, Neil? Can you blow
13 up the --

14 DOCUMENT TECHNICIAN: (Complied with request.)

15 MR. DAVIS: Let's go back so we can see what year
16 that is. I think -- and if we could, just for the record, go
17 back to 5033 for a second?

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. DAVIS:

20 Q 5033, you would agree with me, sir, is an '81 photo?

21 A Yes.

22 MR. DAVIS: Okay. Now let's go to 5036, and let's
23 blow up --

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 BY MR. DAVIS:

1 Q This is an '83 photo, is it not, Dr. Powell?

2 A Yes. July of '83.

3 MR. DAVIS: Okay. Would you blow up the loading
4 area, Neil?

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. DAVIS:

7 Q And again, we have another wet spot in front of the
8 drumming shed, don't we?

9 A Yes, we do.

10 Q And do you see any evidence that the natural flow pattern
11 that that wet spot represents is westward around the small
12 warehouse?

13 A Yes, I do.

14 Q How far?

15 A Over to the corner where the ditch is paralleling the
16 railroad tracks.

17 Q All right. To the drumming shed?

18 A From the drumming shed over to the corner where the ditch
19 is paralleling the railroad tracks.

20 Q But you'd agree, would you not, sir, that there seems to
21 be a larger area right in front of the drumming shed that it's
22 pooled before any of it ran off to the west?

23 A Yes.

24 MR. DAVIS: Okay. And, finally, let's look at 5042,
25 please, Neil.

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 MR. DAVIS: Let's blow that up.

3 BY MR. DAVIS:

4 Q And this, again, before you blow it up, is a 1987
5 photograph?

6 A That's correct.

7 MR. DAVIS: Okay. Let's blow up the operations
8 area. Can we blow up any more?

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 BY MR. DAVIS:

11 Q It looks to me here, doesn't it to you, Dr. Powell, that
12 it looks like there's some kind of liquid that came down from
13 the small warehouse and pooled up in the asphalt loading area
14 in front of where the drumming shed used to be?

15 A There is a dark area there that would be consistent with
16 a liquid release.

17 Q Yeah. And you can see a trail coming right out of the
18 small warehouse, can't you?

19 A I see a dark area that might be a trail for the liquid,
20 yes.

21 Q Yeah. Yeah. So that would represent a flow in exactly
22 the opposite direction of the one that you posited likely
23 caused this 500-gallon spill to get to the northwest corner?

24 A That flow is off to the east. It is not to the west.

25 Q 180 degrees the wrong way, isn't it?

1 A I wouldn't agree it's the wrong way.

2 Q For your theory, for the theory that Soco is trying to
3 advocate in this courtroom, it's 180 degrees the wrong way for
4 that, from that theory, isn't it?

5 A No, I don't agree with that characterization.

6 Q All right. You'd agree, though, that the picture clearly
7 demonstrates that something is flowing eastward from the
8 warehouse and collecting in a puddle on the asphalt?

9 A Yes, I'd agree with that.

10 MR. DAVIS: Thank you. I have nothing further.

11 THE COURT: All right. Redirect, sir.

12 REDIRECT EXAMINATION

13 BY MR. LYNCH:

14 Q All right, Dr. Powell. I'll try not to keep you here too
15 long.

16 First, Julianne, can you please pull up the photograph
17 that was just up, the 4/30/1987 photo, Exhibit 5042?

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. LYNCH:

20 Q This is the photo you were just looking at, Dr. Powell,
21 and as we discussed before, by this time am I correct the
22 catch pond had been removed and Dyce had installed the
23 concrete tank farm with the containment units behind it?

24 A That's correct.

25 Q And is it your understanding at this time the drainage of

1 the facility was meant to be such that water in the
2 loading/unloading area would drain into that concrete tank
3 farm?

4 A Yes, into the tank farm and then into the containment
5 ponds.

6 Q It's not your opinion in this case that as of 1987, when
7 the site had been reconfigured, that the drainage from the
8 loading/unloading area was out to the northwest corner?

9 A No, it's not.

10 MR. GROSSBART: Your Honor, could he not lead the
11 witness, please?

12 THE COURT: Yeah. Ask him questions on redirect,
13 not lead him. At least not to that extent.

14 MR. LYNCH: I apologize, Your Honor.

15 Could you please pull up Exhibit D079? I'm sorry;
16 Illustrative DD -- that's the wrong one. I'm sorry. Now I'm
17 getting confused as to which is in. DD105.

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. LYNCH:

20 Q This is the pie chart that we were referring to earlier.
21 Do you recall that, Dr. Powell?

22 A Yes.

23 MR. LYNCH: Now please pull up Illustrative DD078.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 BY MR. LYNCH:

1 Q This is a chart that -- strike that.

2 Dr. Powell, this is a chart entitled "Groundwater Samples
3 with PCE Greater than 2,400 Micrograms Per Liter"; is that
4 correct?

5 A That's correct.

6 Q And are those the locations that are depicted on the pie
7 chart we just saw?

8 A Yes, I believe that's the case.

9 Q Okay. And if you look at the bottom where I've just
10 drawn the line, those are the several T samples that I believe
11 Mr. Grossbart was referring to; is that correct?

12 A Yes.

13 Q And what's the date those samples were taken on?

14 A October 12 of 2004.

15 MR. LYNCH: Close out of this one, please, Julianne.

16 DOCUMENT TECHNICIAN: (Complied with request.)

17 MR. LYNCH: Please pull up Exhibit 4400, 4400, and
18 go to page -- I lost my page now. Go to page 31, please, of
19 this exhibit.

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. LYNCH:

22 Q Dr. Powell, is this the soil vapor extraction report from
23 ATC?

24 A Yes, it is.

25 Q And this is the pilot test where they were pulling vapors

1 through the trenches Mr. Grossbart was referring to; is that
2 correct?

3 A Yes, it is.

4 MR. LYNCH: Please go to page 34 of this report.
5 And if you'd pull up the second paragraph, please?

6 DOCUMENT TECHNICIAN: (Complied with request.)

7 BY MR. LYNCH:

8 Q In the final sentence of that paragraph, Dr. Powell, does
9 it state when that remediation test was begun?

10 A October 12 of 2004.

11 Q So is it correct that the T samples were not commenced
12 after this, or were not taken after this system had been
13 commenced?

14 A No, they appear to be taken the day the system began
15 operation.

16 MR. LYNCH: Close out of that, please, Julianne.

17 DOCUMENT TECHNICIAN: (Complied with request.)

18 BY MR. LYNCH:

19 Q Now prior to that, there had been some remediation
20 systems in the northwest corner area, correct?

21 A There were two short-term pilot tests. I don't know that
22 I would call those remediation systems, but there were two
23 pilot tests.

24 MR. LYNCH: Please pull up Exhibit 3191.

25 DOCUMENT TECHNICIAN: (Complied with request.)

1 BY MR. LYNCH:

2 Q And this is another document Mr. Grossbart had shown you.
3 It's a report from some of ATC's pilot tests that you were
4 just referring to; is that correct?

5 A That's correct.

6 MR. LYNCH: Okay. And if you go to page 2 of this
7 exhibit, please, and pull out the first two paragraphs,
8 please?

9 DOCUMENT TECHNICIAN: (Complied with request.)

10 BY MR. LYNCH:

11 Q The final sentence in the first paragraph refers to the
12 trenches that were excavated that Mr. Grossbart asked you
13 about; is that correct?

14 A That's right.

15 Q And the second -- strike that.

16 The second paragraph states, "The OS/SVE pilot test was
17 initially conducted for eight weeks beginning on January 3,
18 2003. During the pilot test, concentrations of PCE declined
19 97 percent and 74 percent respectively at Monitoring Wells
20 PT-2 and PT-6."

21 Does that indicate that the results of this testing was
22 actually to reduce concentrations of PCE in the water in the
23 northwest corner?

24 A Yes, that was the intent of it.

25 Q So to the extent that you referred to groundwater samples

1 taken from the northwest corner after this date, would those
2 results tend to bias the samples low or bias them high?

3 A It would bias them low.

4 Q Because there would be less PCE in the groundwater?

5 A Yes.

6 Q You were asked questions on cross about some of the
7 devegetated areas in the photographs. I'd like to go through
8 some of those with you.

9 First, can you please pull up Exhibit 5009?

10 DOCUMENT TECHNICIAN: (Complied with request.)

11 BY MR. LYNCH:

12 Q And Dr. Powell, that's a 1972 aerial photograph; is that
13 correct?

14 A Right.

15 Q Is it your understanding that that's before Dyce moved
16 out to the property?

17 A That's correct.

18 Q Do you see a devegetated area where I've traced?

19 A Yes, I do.

20 Q And in your opinion, what's the likely cause of that
21 devegetation?

22 A 2,4-D.

23 Q And can 2,4-D persist in the soil for a long time,
24 Dr. Powell?

25 A Yes. It's a very persistent herbicide.

1 MR. LYNCH: Please pull up 5015.

2 DOCUMENT TECHNICIAN: (Complied with request.)

3 BY MR. LYNCH:

4 Q This is a 1973 photograph, and, again, we see an area of
5 devegetation, is that correct --

6 A That's correct.

7 Q -- on this photograph?

8 A That's correct.

9 Q And is it your understanding that this is again before
10 Dyce had at least started operations in the tank farm in the
11 facility?

12 A Yes. There's no tank farm in this photo.

13 Q Do you have an opinion as to what the likely cause of
14 that devegetation is?

15 A 2,4-D.

16 MR. LYNCH: Please pull up a photograph
17 Mr. Grossbart didn't show you, 5026.

18 DOCUMENT TECHNICIAN: (Complied with request.)

19 BY MR. LYNCH:

20 Q And that's a 1978 aerial photograph, Dr. Powell. Do you
21 see another area of devegetation coming from here that links
22 out and heads out towards the northwest corner?

23 A Yes.

24 Q Could that also be the result of remnants of 2,4-D?

25 A Well, certainly a portion of it is likely from 2,4-D, up

1 to approximately here. Beyond that, it could be from 2,4-D or
2 other causes. It could be from something released along the
3 siding.

4 MR. LYNCH: And please pull up Exhibit 5027.

5 DOCUMENT TECHNICIAN: (Complied with request.)

6 BY MR. LYNCH:

7 Q That's a 1979 photograph that we haven't seen yet. Do
8 you see the dark line I've traced there, Dr. Powell?

9 A Yes, I see it.

10 Q Could you maybe -- thank you, Julianne.

11 And I believe earlier did you testify what might dark
12 soils indicate?

13 A Normally they indicate soil that's wet.

14 Q And is that the pathway along the ditch to the east side
15 of the rail spur that you've previously discussed?

16 A Yes, it is.

17 Q Does it head out to the northwest corner?

18 A Yes, it does.

19 MR. LYNCH: Please go to 5029; I'm sorry, 5028.

20 DOCUMENT TECHNICIAN: (Complied with request.)

21 BY MR. LYNCH:

22 Q This is the 1979 photograph we're more familiar with.
23 Could you describe for us or tell us how small releases of
24 acid during unloading operations might contribute to the
25 vegetation along the northwest corner area?

1 A Well, acid is typically very concentrated, and when you
2 mix, mix it even with large volumes of water, you're still
3 going to end up with a solution that has a very low pH, so
4 small releases of acid along the rail siding which
5 subsequently are washed and mixed with even a relatively large
6 amount of stormwater are going to cause a progressive
7 acidification of the soils in the northwest corner area that
8 will be injurious to the vegetation, causing kill-off of the
9 vegetation. A little acid goes a long way when it's mixed
10 with water.

11 Q Dr. Powell, if -- what would be the -- strike that.

12 Close out of this, please.

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 MR. LYNCH: May I approach the witness, Your Honor?

15 THE COURT: (No response.)

16 MR. LYNCH: Your Honor, may I approach?

17 THE COURT: Yes. I'm daydreaming here. It's
18 getting late.

19 MR. LYNCH: I'll try and be brief.

20 THE COURT: Don't take it personally. It's just
21 late in the day on a Friday.

22 MR. LYNCH: Could you please pull up Exhibit 5038,
23 Julianne; or, I'm sorry, 3058, Julianne?

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 BY MR. LYNCH:

1 Q Dr. Powell, this is the final addendum report you've been
2 shown both on direct and cross; is that correct?

3 A That's correct. It's the final RI addendum.

4 Q I'm sorry, the final RI addendum.

5 Please go to page 26 of the exhibit, Julianne. Pull out
6 the portion of the page under 5.4.

7 DOCUMENT TECHNICIAN: (Complied with request.)

8 BY MR. LYNCH:

9 Q And that portion of the page, titled "NAPL Source Areas,"
10 states, "One or more of the following criteria were used to
11 identify PCE NAPL source areas in the study area," then lists
12 the various criteria.

13 If you look at the first two criteria there, Dr. Powell,
14 are those the soil concentrations and off-scale MIP readings
15 that you were discussing earlier today?

16 A That's right.

17 MR. LYNCH: And then go to the next page, please,
18 Julianne.

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 BY MR. LYNCH:

21 Q And the bullet point on the top is the groundwater PCE
22 concentrations; is that correct?

23 A That's correct.

24 MR. LYNCH: Would you please, Julianne, go to
25 page 39 of this exhibit?

1 DOCUMENT TECHNICIAN: (Complied with request.)

2 BY MR. LYNCH:

3 Q And, Dr. Powell, that's a table from the same document
4 entitled "Evaluation of Criteria for PCE NAPL Source
5 Identification." Am I correct that it lists the boring or
6 monitoring wells that EPA relied on to delineate the DNAPL
7 areas, and then there's an X if they met one of the DNAPL
8 criteria? Is that correct?

9 A That's right.

10 MR. LYNCH: Julianne, could you please pull up
11 page 50 of this document? And could you zoom in on the
12 northwest corner, please?

13 DOCUMENT TECHNICIAN: (Complied with request.)

14 BY MR. LYNCH:

15 Q And, Dr. Powell, do you see there, there are various
16 borings that are within the northwest corner; is that correct?

17 A That's correct.

18 MR. LYNCH: Julianne, could you leave this up?

19 DOCUMENT TECHNICIAN: (Complied with request.)

20 BY MR. LYNCH:

21 Q But, Dr. Powell, could you turn back to the page we were
22 just on, the table?

23 A Okay.

24 Q And now I've lost it.

25 Page 39. What was the MIP reading for MP-119?

1 A It reports that it was off scale.

2 Q How about MP-120?

3 A Off scale.

4 Q How about MP-121?

5 A Off scale.

6 Q How about MP-122?

7 A Off scale.

8 Q How about MP-132?

9 A Off scale.

10 Q How about MP-137?

11 A Off scale.

12 Q Let's go back up to this one at the top. How about
13 MP-100?

14 A Off scale.

15 Q And then how about MP-139?

16 A Off scale.

17 Q And, Dr. Powell, am I correct that this chart indicates
18 that all of those off-scale MIP readings are within the
19 northwest corner source area?

20 A Yes.

21 MR. LYNCH: Can you remove the highlighting,
22 Julianne?

23 DOCUMENT TECHNICIAN: (Complied with request.)

24 BY MR. LYNCH:

25 Q Dr. Powell, I believe you testified that soil

1 concentrations were the most reliable indicator of a localized
2 DNAPL source area; is that correct?

3 A Yes, they're the most unambiguous indication.

4 Q Are you on page 39 of the document?

5 A Yes, I am.

6 Q If you look at where saturated soil PCE concentrations
7 were greater than the 1.89 indicator identified by EPA, can
8 you tell me whether that indicator was met with PZ-8 or just
9 touched?

10 A Yes, they report that as above the 189 parts per million.

11 Q How about PZ-10?

12 A Yes.

13 Q PZ-11?

14 A Yes.

15 Q PZ -- PT-2?

16 A Yes.

17 Q And I'm not seeing the other ones. That suffices.

18 Were some of those concentrations -- and those are
19 labeled, on this chart, PZSB numbers; is that correct? "SB"
20 stands for a soil boring that was also taken at that location?

21 A Yes, that's right.

22 Q If you'd go to page 35 of the same document, Dr. Powell?
23 Julianne, stay here.

24 DOCUMENT TECHNICIAN: (Complied with request.)

25 BY MR. LYNCH:

1 Q Do you recall what the soil concentrations found at
2 MP-105 under the catch pond were?

3 A .17, 0.17 ppm.

4 Q What's the concentration of perc that was found in
5 PZSB-8, according to the chart of page 35 of the RI?

6 A 992.

7 Q How many times greater than was found at MP-105, roughly?

8 A (No response.)

9 Q Too late in the day for that?

10 A Too late in the day for that. I can do it, but I can't
11 do it quickly.

12 Q A little over 1,000 times?

13 A Oh, yeah. Much more than 1,000. Several thousand times.

14 Q How about PZSB-10?

15 A 1,290.

16 Q Even greater?

17 A Yes.

18 Q PZSB-11?

19 A 520.

20 Q PT-2B, which I don't see. Do you understand that PT-2B
21 is in the approximate location of PT-2?

22 A Yes, it's the same location. 1,820.

23 Q Okay. And PZ-19, PZSB-19?

24 A 546.

25 Q And all of those locations are in the northwest corner

1 source area, correct?

2 A Yes.

3 Q Does that lead you to believe that the northwest
4 source -- what does that indicate about the northwest corner
5 source area?

6 A Well, I think it's clear there's a large DNAPL zone there
7 interconnected between these borings.

8 Q And is that anything like what's found in MP-105?

9 A No, it is thousands of times more contaminated than
10 MP-105.

11 MR. LYNCH: I have no further questions.

12 THE COURT: Well, that's good. I was just going to
13 take a break. You can step down. You're done.

14 THE WITNESS: Thank you.

15 THE COURT: Let's take a quick break.

16 THE LAW CLERK: All rise.

17 (Jury not present.)

18 THE COURT: Counsel, get your software people or
19 your computer gurus. My law clerk is going to take them down
20 to talk with our IT expert so we can find out what kind of
21 software you're using. And he thinks we can convert it to a
22 .pdf format that can be uploaded onto a court computer and
23 that would be -- so go down there now with my law clerk.

24 MR. LYNCH: Okay.

25 MR. JOHNSON: Thank you, Your Honor.

1 (Recess taken from 16:03:39 to 16:12:13.)

2 (Open court.)

3 (Jury present.)

4 THE COURT: Please be seated.

5 Call your next witness.

6 MR. COZZENS: Your Honor, Soco rests their case in
7 chief.

8 THE COURT: Ladies and gentlemen, I know you're not
9 going to like this, but I'm going to send you home. All
10 right. You'll just have to leave here disappointed, is all.

11 All right. We're going to be in recess until Monday
12 morning at 8:30.

13 I give you the usual admonition. Don't talk to
14 anybody about the case. Don't talk amongst yourselves. Keep
15 an open mind. If there are articles in the paper, don't tweet
16 or whatever all the other things I told you about. Don't do
17 any of those things. Don't do any research on the internet.

18 We'll see you Monday morning.

19 THE LAW CLERK: All rise.

20 (Jury not present.)

21 THE COURT: Be seated.

22 Some of you are going to make a motion?

23 MR. JOHNSON: It just so happens, Your Honor, that I
24 have a motion. We'll file it officially -- do you want two
25 copies?

1 THE CLERK: Yes. Thank you, sir.

2 MR. JOHNSON: We have a motion, Your Honor, for
3 judgment as a matter of law.

4 The centerpiece of our motion, although there are
5 several grounds for it, Your Honor --

6 THE COURT: Well, if you're doing it in writing, why
7 do you need to --

8 MR. JOHNSON: I just thought I'd preface it a little
9 bit. If you just want to read it, that's fine with us, Your
10 Honor.

11 THE COURT: Yeah. I have to say that I don't think
12 "gunshy" would be an understatement on my part.

13 MR. JOHNSON: We can always take a sealed verdict.

14 THE COURT: I think we had a note from the jury --

15 MR. JOHNSON: Yeah.

16 THE COURT: -- saying there wasn't enough, but the
17 Court of Appeals, in their wisdom, said, well, yeah, there
18 was.

19 MR. JOHNSON: Well, Your Honor, what's different
20 about this motion than the one we filed three years ago is the
21 testimony that we heard from both Mr. Naff and Dr. Powell who
22 have testified that Dyce intentionally and deliberately
23 constructed its facility so that any large spill of perc would
24 run off into the environment, into the ditch, and then off
25 into the northwest corner.

1 That's different testimony than we heard last time,
2 Your Honor, definitive testimony that they made it that way,
3 and since they made it that way and they understood that perc
4 was going to damage the environment and third-party property,
5 they have not proved an occurrence. An occurrence requires
6 that the damage be unexpected, and here the damage was not
7 unexpected from any large spill. Quite to the contrary. It
8 was wholly expected by them because they knew that if there
9 was any large spill of chemical, it would run directly off
10 into the environment and create property damage, Your Honor.

11 Accordingly, there's no occurrence, and that is a
12 different issue than what fully was decided last time by the
13 Ninth Circuit with regard to the sudden and accidental issue.

14 THE COURT: I remember, gee, back 30 years ago,
15 neither one -- is it called neither intended or expected or
16 something like that, from the standpoint of the insured?

17 MR. JOHNSON: Yeah. The policy requires that the
18 property damage be neither expected nor intended from the
19 standpoint of the insured, and if there -- if you don't have
20 that, you don't have an occurrence. And in order to get
21 coverage, you have to prove an occurrence, and they haven't
22 done it here.

23 THE COURT: Well, I'll tell you what. I'll give you
24 guys -- do you want a chance to respond to this by Monday?

25 MR. COZZENS: We would like that, Your Honor, yes.

1 THE COURT: You've got it. I'll reserve until
2 Monday.

3 MR. JOHNSON: Thank you, Your Honor.

4 MR. COZZENS: Your Honor, the only other thing that
5 we have is we just want to make sure that we're clear on what
6 you've done with the depositions. Is the Simko deposition
7 going to be read?

8 THE COURT: Oh, I don't know. Here. Just sit
9 tight. Let me get my notes in here. I left them on my desk.

10 MR. JOHNSON: We have rulings that were given to us,
11 Your Honor, on Simko.

12 THE COURT: Well, but I still haven't ruled on the
13 motion.

14 MR. JOHNSON: Okay.

15 THE COURT: You're not going to go through all of
16 it.

17 (Pause.)

18 THE COURT: Thanks for reminding me. I am going to
19 grant your motion in part; when I say "yours," I'm talking
20 about Soco's motion in part to the deposition testimony of
21 Jeffrey Simko. The only thing I believe that is not
22 cumulative from his testimony is his testimony instructed
23 employees to destroy environmental audits and corrective
24 action plans related to the Dyce site, and that's it. I
25 don't, I don't want to hear testimony about him refuting

1 Soco's clean company theory or the waste minimization plan due
2 to the concern that they weren't handling -- already handled
3 stuff. How is that? You got the parameter?

4 MR. COZZENS: Thank you, Judge.

5 MR. JOHNSON: We understand. We'll cut it back.

6 MR. COZZENS: Thank you.

7 THE COURT: What else?

8 MR. COZZENS: That's all we have, Judge.

9 THE COURT: You can't get a directed verdict at this
10 time.

11 MR. COZZENS: You know, I wasn't going to move,
12 Judge.

13 THE COURT: Maybe that would be the way to go.

14 MR. COZZENS: As much as I enjoy your company, I
15 wouldn't want to be back here again.

16 THE COURT: Yeah. Who knows?

17 THE LAW CLERK: All rise.

18 (Proceedings were recessed at 16:19:22.)
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VOLUME 5 REPORTER'S CERTIFICATE

I, JoAnn Corson Bacheller, a Registered Diplomat Reporter and Certified Realtime Reporter, certify that the foregoing transcript is a true and correct record of the proceedings given at the time and place hereinbefore mentioned; that the proceedings were reported by me in machine shorthand and thereafter reduced to typewriting using computer-assisted transcription; that after being reduced to typewriting, a certified copy of this transcript will be filed electronically with the Court.

I further certify that I am not attorney for, nor employed by, nor related to any of the parties or attorneys to this action, nor financially interested in this action.

IN WITNESS WHEREOF, I have set my hand at Billings, Montana this 27th day of April, 2010.

/s/ JoAnn Corson Bacheller

JoAnn Corson Bacheller
United States Court Reporter